```
//////////////////////////////////////
/// 640x480 version!
/// test VGA with hardware video input copy to VGA
// compile with
// gcc fp_test_1.c -o fp1 -lm
//////////////////////////////////////
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <unistd.h>
#include <fcntl.h>
#include <sys/types.h>
#include <sys/ipc.h>
#include <sys/shm.h>
#include <sys/mman.h>
#include <sys/time.h>
#include <math.h>

#include "address_map_arm_brl4.h"

#define PIO_RST 0x10
#define PIO_CI1_NEW 0x20
#define PIO_CI2_NEW 0x30
#define PIO_CI3_NEW 0x40

volatile unsigned int * pio_rst_ptr = NULL;
volatile unsigned int * pio_ci1_new_prt = NULL;
volatile unsigned int * pio_ci2_new_prt = NULL;
volatile unsigned int * pio_ci3_new_prt = NULL;

/* function prototypes */
void VGA_text (int, int, char *);
void VGA_text_clear();
void VGA_box (int, int, int, int, short);
void VGA_line(int, int, int, int, short) ;
void VGA_disc (int, int, int, short);
int  VGA_read_pixel(int, int) ;
int  video_in_read_pixel(int, int);
void draw_delay(void) ;
int d2b(float num);
double b2d(int num);
double normpdf(int, int);
double Kull(int, int);
double dist_fn(int,int, int, int);
```

```
void maximum(double *a,double *max,int *max_index, int a_num);
void minimum(double *a,double *min, int *min_index, int a_num);
void nms(double *r);
void getcord(double *r);

int test_data[2][101];
// the light weight buss base
void *h2p_lw_virtual_base;

// RAM FPGA command buffer
volatile unsigned int * sram_ptr = NULL ;
void *sram_virtual_base;

// pixel buffer
volatile unsigned int * vga_pixel_ptr = NULL ;
void *vga_pixel_virtual_base;

// character buffer
volatile unsigned int * vga_char_ptr = NULL ;
void *vga_char_virtual_base;

// /dev/mem file id
int fd;

// pixel macro
// !!!PACKED VGA MEMORY!!!
#define VGA_PIXEL(x,y,color) do{\
        char  *pixel_ptr ;\
        pixel_ptr = (char *)vga_pixel_ptr + ((y)*640) + (x) ;\
        *(char *)pixel_ptr = (color);\
} while(0)


// measure time
struct timeval t1, t2;
double elapsedTime;
struct timespec delay_time ;

int main(int argc, char *argv[])
{
        delay_time.tv_nsec = 10 ;
        delay_time.tv_sec = 0 ;
```

```
	// Declare volatile pointers to I/O registers (volatile	// means that IO load and store
instructions will be used	// to access these pointer locations,
	// instead of regular memory loads and stores)

	// === need to mmap: =======================
	// FPGA_CHAR_BASE
	// FPGA_ONCHIP_BASE
	// HW_REGS_BASE

	// === get FPGA addresses ==================
   // Open /dev/mem
	if( ( fd = open( "/dev/mem", ( O_RDWR | O_SYNC ) ) ) == -1 )	{
		printf( "ERROR: could not open \"/dev/mem\"...\n" );
		return( 1 );
	}

   // get virtual addr that maps to physical
	// for light weight bus
	h2p_lw_virtual_base = mmap( NULL, HW_REGS_SPAN, ( PROT_READ |
PROT_WRITE ), MAP_SHARED, fd, HW_REGS_BASE );
	if( h2p_lw_virtual_base == MAP_FAILED ) {
		printf( "ERROR: mmap1() failed...\n" );
		close( fd );
		return(1);
	}

	// === get VGA char addr =====================
	// get virtual addr that maps to physical
	vga_char_virtual_base = mmap( NULL, FPGA_CHAR_SPAN, ( PROT_READ |
PROT_WRITE ), MAP_SHARED, fd, FPGA_CHAR_BASE );
	if( vga_char_virtual_base == MAP_FAILED ) {
		printf( "ERROR: mmap2() failed...\n" );
		close( fd );
		return(1);
	}

   // Get the address that maps to the character
	vga_char_ptr =(unsigned int *)(vga_char_virtual_base);

	// === get VGA pixel addr ====================
	// get virtual addr that maps to physical
	// SDRAM
	vga_pixel_virtual_base = mmap( NULL, FPGA_ONCHIP_SPAN, ( PROT_READ |
PROT_WRITE ), MAP_SHARED, fd, SDRAM_BASE); //SDRAM_BASE
```

```
        if( vga_pixel_virtual_base == MAP_FAILED ) {
                printf( "ERROR: mmap3() failed...\n" );
                close( fd );
                return(1);
        }
   // Get the address that maps to the FPGA pixel buffer
        vga_pixel_ptr =(unsigned int *)(vga_pixel_virtual_base);

        // === get RAM FPGA parameter addr =========
        sram_virtual_base = mmap( NULL, FPGA_ONCHIP_SPAN, ( PROT_READ |
PROT_WRITE ), MAP_SHARED, fd, FPGA_ONCHIP_BASE); //fp

        if( sram_virtual_base == MAP_FAILED ) {
                printf( "ERROR: mmap3() failed...\n" );
                close( fd );
                return(1);
        }
   // Get the address that maps to the RAM buffer
        sram_ptr =(unsigned int *)(sram_virtual_base);

        // ========================================

        /* create a message to be displayed on the VGA
       and LCD displays */
        /*
        char text_top_row[40] = "DE1-SoC ARM/FPGA\0";
        char text_bottom_row[40] = "Cornell ece5760\0";
        */
        char num_string[20], time_string[50] ;

        // a pixel from the video
        int pixel_color;
        // video input index
        int i,j,k,l, count;

        // clear the screen//0x9f
        VGA_box (0, 0, 639, 479, 0x9f);
        // clear the text
        VGA_text_clear();

        VGA_box(50, 420, 250, 470, 0x22); //start image
```

```
	int start_msg[280] =
{0,0,1,1,1,0,0,0,1,1,1,1,1,0,0,0,1,1,1,0,0,0,1,1,1,1,0,0,0,1,1,1,1,1,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0,
1,0,0,0,1,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,0,0,
1,0,0,0,0,0,1,1,1,0,0,0,0,0,1,0,0,0,0,1,0,0,0,1,0,0,1,1,1,1,0,0,0,0,0,1,0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,
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0,0,0,1,0,0,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,1,0,0,1,0,0,1,0,0,0,0,0,1,0,0,0,0,0,1,1,1,0,0,0,0,
0,1,0,0,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0};
	for (j=2; j < 282; j++){
		if(start_msg[j-2] == 1){
				VGA_box(3*((j-2)%35-1) + 100, 3*((j-2)/35-1)+435, 3*((j-2)%35-1)
+ 103, 3*((j-2)/35-1)+438, 0xff);
	    }
	}



	count = 0;
	pio_rst_ptr =(unsigned int *)(h2p_lw_virtual_base + PIO_RST);
	pio_ci1_new_prt = (unsigned int *)(h2p_lw_virtual_base + PIO_CI1_NEW);
	pio_ci2_new_prt = (unsigned int *)(h2p_lw_virtual_base + PIO_CI2_NEW);
	pio_ci3_new_prt = (unsigned int *)(h2p_lw_virtual_base + PIO_CI3_NEW);

	int user_input;
	char user_char;
	printf("Which letter are you going to test?\n");
	scanf(" %c",&user_char);

	int hexval[1024];
	if (argc > 1024) {
		for (i=0; i < 1024; i++) {
			hexval[i] = atoi(argv[i+1]);
		}
	} else {
		printf("Please enter array represetation:\n");
		for (i = 0; i < 1024; i++) {
			scanf("%1d", &hexval[i]);
		}
	}
	//double hexval[1024] =
{0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
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0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,-0.0171797773185027,-0.0336957356593
392,-0.0331938561434513,-0.0227379506006663,-0.0352548310677896,-0.040490491162063
7,-0.0399507627706937,-0.0399506057142003,-0.0399506057142003,-0.0399506057142003,-
0.0399506057142003,-0.0399506057142003,-0.0400156245546053,-0.0404053597480225,-0.
```

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{0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,1,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,1,1,1,0,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,1,1,1,1,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,0,0,
0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,1,1,1,1,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,1,1,1,1,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,
1,1,1,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,0,0,0,0,
0,0,0,0,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,
0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,
1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,
0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,
0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,1,1,1,1,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0};
	//int hexval[1024] =
{0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,1,1,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,0,
0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,1,1,1,0,0,0,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,1,1,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
1,1,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,0,0,0,0,
0,0,0,0,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,
1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,
0,0,0,0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,
```

```
0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0};
        *(sram_ptr + 1) = 1;
        for (i=2; i < 1026; i++){
                //*(sram_ptr+i) = d2b(hexval[i-2]);
                if(hexval[i-2] == 1){
                        *(sram_ptr+i) = 2097152;
                        VGA_box(12*((i-2)%32-1) + 140, 12*((i-2)/32-1)+20, 12*((i-2)%32-1) +
152, 12*((i-2)/32-1)+32, 0xFF);
            }
                else{
                        *(sram_ptr+i) = 0;
                        VGA_box(12*((i-2)%32-1) + 140, 12*((i-2)/32-1)+20, 12*((i-2)%32-1) +
152, 12*((i-2)/32-1)+32, 0x00);
                }
                //*(sram_ptr+i) = hexval[i-1];
        }



        VGA_box(50, 420, 250, 470, 0x22); //loading text image

        int load_msg[392] =
{0,1,0,0,0,0,0,0,1,1,1,1,1,0,0,0,1,1,1,0,0,0,1,1,1,0,0,0,0,1,1,1,1,1,0,0,1,0,0,0,1,0,0,0,1,1,1,1,1,0,0,
1,0,0,0,0,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,1,0,0,1,0,0,0,0,0,1,0,0,0,0,1,1,0,0,1,0,0,1,0,0,0,0,0,0,1,0,
0,0,0,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0,1,1,0,0,1,0,0,1,0,0,0,0,0,0,1,0,0,0,
0,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,1,0,1,0,0,1,0,0,0,0,0,0,1,0,0,0,0,0,
0,1,0,0,0,1,0,0,1,1,1,1,1,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,1,0,1,0,0,1,0,1,1,1,0,0,1,0,0,0,0,0,0,1,
0,0,0,1,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,1,1,0,0,1,0,0,0,1,0,0,1,0,0,0,0,0,0,1,0,0,
0,1,0,0,1,0,0,0,1,0,0,1,0,0,1,0,0,0,0,0,0,1,0,0,0,0,1,0,0,1,1,0,0,1,0,0,0,1,0,0,1,1,1,1,1,0,0,1,1,1,1,1,
0,0,1,0,0,0,1,0,0,1,1,1,0,0,0,0,0,1,1,1,1,1,0,0,1,0,0,0,1,0,0,1,1,1,1,1,0};
        for (j=2; j < 394; j++){
                if(load_msg[j-2] == 1){
                                VGA_box(3*((j-2)%49-1) + 80, 3*((j-2)/49-1)+435, 3*((j-2)%49-1) +
83, 3*((j-2)/49-1)+438, 0xff);
            }
        }

        char key;
        printf("Please reset by hitting R\n");
        scanf(" %c",&key);
        if (key=='R'|| key=='r'){
```

```
		*pio_rst_ptr=1;
		*(sram_ptr) = 1;
		gettimeofday(&t1, NULL);
		printf("Reset is detected\n");
}
// start the timer
draw_delay();
*pio_rst_ptr=0;
printf("reset is now 0\n");
//*(sram_ptr) = 1;
printf("hps is ready\n");
while (*(sram_ptr)==1);
gettimeofday(&t2, NULL);
elapsedTime = (t2.tv_sec - t1.tv_sec) * 1000000.0;      // sec to us
elapsedTime += (t2.tv_usec - t1.tv_usec) ;   // us to
//sprintf(num_string, "# = %d     ", total_count);
sprintf(time_string, "T=%8.0f uSec  ", elapsedTime);
printf("T=%8.0f uSec\n", elapsedTime);
VGA_text (10, 3, num_string);
VGA_text (10, 4, time_string);

double result[900];
for (i = 1; i <= 900; i++) {
		result[i-1] = b2d(*(sram_ptr + i)) * 16.0;
}
result[899] = 0;// force to correct
//covert decimal to fixed point
/*for(i=0; i < 900; i++){
		printf("%f\n", result[i]);
}*/

nms(result);

for (i = 1; i <= 900; i++) {
		if(result[i-1] > 0){
			VGA_disc(12*((i-1)%30-1)+152,12*((i-1)/30-1)+32,5,0xe0);
		}
		//printf("The r value of %d is: %f\n", i, result[i-1]);
}
getcord(result);
//
//printf("Thes number of corners is %d\n", test_data[0][0]);
/*for (i = 0; i < test_data[0][0]; i++) {
		printf("[%d, %d]\n", test_data[0][i+1], test_data[1][i+1]);
```

```
        }*/

        // start testing
        //int test_data[2][20] = {{19,
2,2,28,2,2,28,13,16,27,13,16,27,29,5,5,5,5,28,30},{0,2,20,2,11,29,29,9,9,9,22,22,22,12,4,9,22,2
7,5,19}};
        //int train_data[2][2][25] = {{{13, 7,24,23,22,22,9,7,7,25,27,12,16,27, 99, 99, 99, 99, 99,
99, 99, 99, 99, 99, 99},{0 ,20,10,24,16,20,15,7,10,20,11,16,16,14, 99, 99, 99, 99, 99, 99, 99, 99,
99, 99, 99}},{{10, 9, 12, 8, 13, 15, 23, 16, 24, 20, 15, 99, 99, 99, 99, 99, 99, 99, 99, 99, 99, 99,
99, 99, 99},{0 ,9, 19, 21, 11, 20, 10, 11, 22, 21, 16, 99, 99, 99, 99, 99, 99, 99, 99, 99, 99, 99,
99, 99}}};
        //int train_data[2][26][2][25] =
{{{{10,24,18,20,16,18,7,26,11,21,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,15,18,18
,21,16,20,16,21,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,25,15,7,18,15,19,7,6,25,2
3,25,10,8,99,99,99,99,99,99,99,99,99,99,99},{0,10,12,10,11,17,21,19,16,13,21,16,20,13,99,99,
99,99,99,99,99,99,99,99,99,99}},{{9,8,19,6,8,22,12,25,25,21,99,99,99,99,99,99,99,99,99,99,99,99,
99,99,99},{0,19,8,14,10,24,8,14,18,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,25,6,
25,6,9,19,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,11,17,18,20,21,12,99,9
9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,15,23,16,23,6,8,13,19,6,26,14,15,25,25,
99,99,99,99,99,99,99,99,99,99,99},{0,8,22,11,11,16,11,23,9,23,10,19,16,15,18,99,99,99,99,99,99,
99,99,99,99}},{{8,25,16,16,6,6,9,14,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,
10,13,11,21,11,21,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,15,21,6,17,15,25,
22,18,10,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,17,17,10,14,22,12,22,12,20,99,9
9,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,15,18,9,15,7,25,18,21,25,10,16,99,99,99,99,99,99
,99,99,99,99,99,99,99},{0,20,12,9,11,19,11,20,21,22,19,23,99,99,99,99,99,99,99,99,99,99,99,9
9,99}},{{11,6,26,24,24,7,9,25,6,14,9,27,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,8,15,12,
12,15,24,8,13,18,11,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,5,25,7,20,9,24,27,13,99,99,9
9,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,9,11,17,15,16,15,17,99,99,99,99,99,99,99,99,
99,99,99,99,99,99,99,99}},{{10,17,13,7,5,15,26,19,8,23,21,99,99,99,99,99,99,99,99,99,99,99,99
,99,99},{0,10,10,8,18,13,9,17,16,23,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,26,25,7
,10,18,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,21,11,11,11,14,99,99,
99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,11,15,22,7,7,11,23,26,17,18,14,99,99,9
9,99,99,99,99,99,99,99,99,99,99,99},{0,22,16,7,22,10,11,24,23,8,17,21,99,99,99,99,99,99,99,99,9
9,99,99,99,99}},{{9,8,24,21,25,6,13,21,15,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,
12,22,21,9,22,13,24,16,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,6,15,24,10,19,10
,13,20,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,22,14,11,21,21,9,9,18,99,99,99,
99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,25,6,17,8,11,17,14,6,99,99,99,99,99,99,99,99,99,99,
99,99,99,99,99,99},{0,11,11,12,14,21,17,20,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,9
9}},{{12,18,16,25,21,24,6,20,25,22,21,10,14,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,16,24,
19,20,15,7,11,10,22,20,8,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,25,16,6,16,25,8,20,11,9,99,
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99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,11,25,25,19,9,12,22,99,99,99,99,99,99,99,99
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9,99,99}},{{7,7,25,6,14,12,19,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,14,
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9,99,99,99,99,99,99,99,99,99}},{{10,24,7,26,6,15,9,19,10,22,9,99,99,99,99,99,99,99,99,99,99,99,9
9,99,99,99},{0,21,13,10,21,16,17,14,11,12,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,
5,9,12,26,15,18,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,16,15,15,15,14,1
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99,99,99,99,99,99,99,99,99,99,99,99},{0,9,25,7,17,10,20,16,15,20,17,99,99,99,99,99,99,99,99,
99,99,99,99,99,99}}},{{{10,24,18,20,16,18,7,26,11,21,22,99,99,99,99,99,99,99,99,99,99,99,99,99,9
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99,99,99}},{{7,25,6,25,6,9,19,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,11,1
7,18,20,21,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,15,23,16,23,6,8,13,19
,6,26,14,15,25,25,99,99,99,99,99,99,99,99,99,99},{0,8,22,11,11,16,11,23,9,23,10,19,16,15,18,9
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,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,12,9,11,19,11,20,21,22,19,23,99,99,99,99,99,9
9,99,99,99,99,99,99,99}},{{11,6,26,24,24,7,9,25,6,14,9,27,99,99,99,99,99,99,99,99,99,99,99,99,
99},{0,20,8,15,12,12,15,24,8,13,18,11,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,5,25,7,20,9
,24,27,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,9,11,17,15,16,15,17,99,99,9
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99,99,99,99,99,99,99,99},{0,10,10,8,18,13,9,17,16,23,20,99,99,99,99,99,99,99,99,99,99,99,99,
99,99}},{{6,26,25,7,10,18,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,21,
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6,17,18,14,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,16,7,22,10,11,24,23,8,17,21,99,99,9
9,99,99,99,99,99,99,99,99,99,99}},{{9,8,24,21,25,6,13,21,15,20,99,99,99,99,99,99,99,99,99,99,
99,99,99,99,99},{0,12,22,21,9,22,13,24,16,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{
{9,6,15,24,10,19,10,13,20,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,22,14,11,21,
21,9,9,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,25,6,17,8,11,17,14,6,99,99,99,99,
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9,99},{0,20,16,24,19,20,15,7,11,10,22,20,8,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,25,16,6,1
6,25,8,20,11,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,11,9,15,22,17,9,17,20,99,99
,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,24,9,7,8,25,23,12,14,18,99,99,99,99,99,99,99,99,
99,99,99,99,99,99,99},{0,22,11,16,20,19,14,12,16,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,9
9,99}},{{8,7,8,8,22,7,25,8,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,24,15,18,17,
11,16,7,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,11,25,25,19,9,12,22,99,99,
99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,9,12,16,20,22,22,19,99,99,99,99,99,99,99,99

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9,99,99,99,99,99,99,99,99,99,99},{0,21,13,10,21,16,17,14,11,12,20,99,99,99,99,99,99,99,99,99,99
,99,99,99,99}},{{7,5,9,12,26,15,18,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12
,16,15,15,15,14,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,7,23,24,8,23,23,
25,15,8,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,25,7,17,10,20,16,15,20,17,99,99,9
9,99,99,99,99,99,99,99,99,99,99,99,99}}}};
        //int train_data[2][3][2][25] =
{{{{10,24,18,20,16,18,7,26,11,21,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,15,18,18
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3,25,10,8,99,99,99,99,99,99,99,99,99,99,99},{0,10,12,10,11,17,21,19,16,13,21,16,20,13,99,99,
99,99,99,99,99,99,99,99,99}},{{9,8,19,6,8,22,12,25,25,21,99,99,99,99,99,99,99,99,99,99,99,99,
99,99,99},{0,19,8,14,10,24,8,14,18,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{10,24
,18,20,16,18,7,26,11,21,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,15,18,18,21,16,2
0,16,21,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,25,15,7,18,15,19,7,6,25,23,25,10,
8,99,99,99,99,99,99,99,99,99,99,99},{0,10,12,10,11,17,21,19,16,13,21,16,20,13,99,99,99,99,99
,99,99,99,99,99,99}},{{9,8,19,6,8,22,12,25,25,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}
,{0,19,8,14,10,24,8,14,18,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}}};
        int train_data[45][26][2][25] =
{{{{10,24,18,20,16,18,7,26,11,21,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,15,18,18
,21,16,20,16,21,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,25,15,7,18,15,19,7,6,25,2
3,25,10,8,99,99,99,99,99,99,99,99,99,99,99},{0,10,12,10,11,17,21,19,16,13,21,16,20,13,99,99,
99,99,99,99,99,99,99,99,99}},{{9,8,19,6,8,22,12,25,25,21,99,99,99,99,99,99,99,99,99,99,99,99,
99,99,99},{0,19,8,14,10,24,8,14,18,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,25,6,
25,6,9,19,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,11,17,18,20,21,12,99,9
9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,15,23,16,23,6,8,13,19,6,26,14,15,25,25,
99,99,99,99,99,99,99,99,99,99,99},{0,8,22,11,11,16,11,23,9,23,10,19,16,15,18,99,99,99,99,99,99,
99,99,99,99}},{{8,25,16,16,6,6,9,14,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,
10,13,11,21,11,21,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,15,21,6,17,15,25,
22,18,10,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,17,17,10,14,22,12,22,12,20,99,9
9,99,99,99,99,99,99,99,99,99,99,99,99}},

{{11,15,18,9,15,7,25,18,21,25,10,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,12,9,11,19,
11,20,21,22,19,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,6,26,24,24,7,9,25,6,14,9,27,9
9,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,8,15,12,12,15,24,8,13,18,11,99,99,99,99,99,99,9
9,99,99,99,99,99,99}},{{8,5,25,7,20,9,24,27,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,9
9},{0,22,9,11,17,15,16,15,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,17,13,7,5,
15,26,19,8,23,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,10,8,18,13,9,17,16,23,20,9
9,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,26,25,7,10,18,26,99,99,99,99,99,99,99,99,99,99,99
,99,99,99,99,99,99,99,99},{0,11,21,11,11,11,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,
99,99,99}},{{11,11,15,22,7,7,11,23,26,17,18,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,
16,7,22,10,11,24,23,8,17,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,8,24,21,25,6,13,21,1
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5,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,22,21,9,22,13,24,16,10,99,99,99,99,
99,99,99,99,99,99,99,99,99,99,99,99}},

{{9,6,15,24,10,19,10,13,20,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,22,14,11,21
,21,9,9,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,25,6,17,8,11,17,14,6,99,99,99,99
,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,11,12,14,21,17,20,18,99,99,99,99,99,99,99,99,99,
99,99,99,99,99,99,99}},{{12,18,16,25,21,24,6,20,25,22,21,10,14,99,99,99,99,99,99,99,99,99,99,
99,99},{0,20,16,24,19,20,15,7,11,10,22,20,8,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,25,16,6,
16,25,8,20,11,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,11,9,15,22,17,9,17,20,99,9
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9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,9,12,16,20,22,22,19,99,99,99,99,99,99,99,
99,99,99,99,99,99,99,99,99,99}},

{{7,7,25,6,14,12,19,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,14,11,13,19,
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,99,99,99,99,99,99,99,99,99,99},{0,9,25,7,17,10,20,16,15,20,17,99,99,99,99,99,99,99,99,99,99,99,
99,99,99}}},{{{12,6,16,22,11,13,13,9,26,21,16,26,14,99,99,99,99,99,99,99,99,99,99,99,99},{0,15
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17,26,7,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,13,9,20,12,12,11,22,14,23,16,99,99,9
9,99,99,99,99,99,99,99,99,99,99}},

{{8,7,21,15,23,23,23,10,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,24,7,9,19,1
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99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,13,20,11,12,10,23,18,19,99,99,99,99,99,99,99,99,99
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,99,99,99,99}},{{6,5,14,13,24,18,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,
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99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,23,22,20,14,23,12,9,99,99,99,99,99,99,99,99,99,
99,99,99,99,99,99,99}},{{9,25,17,7,18,21,11,10,15,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,9

9,99},{0,10,21,9,24,13,10,19,10,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,6,14,15,18,22,9,22,25,9,13,18,22,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,21,11,11,22,12,11,10,15,17,16,17,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,18,8,7,16,24,10,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,19,13,20,12,11,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,25,20,22,18,8,22,22,12,25,15,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,21,18,15,19,9,15,12,17,10,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,6,15,17,14,25,7,21,17,10,10,14,17,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,11,19,20,22,22,9,8,21,11,24,22,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{13,7,24,23,22,22,9,7,7,25,27,12,16,27,99,99,99,99,99,99,99,99,99,99,99},{0,20,10,24,16,20,15,7,10,20,11,16,16,14,99,99,99,99,99,99,99,99,99,99,99}},{{12,11,23,6,8,23,25,22,7,26,16,13,19,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,17,22,10,9,12,20,13,19,16,19,16,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,9,22,24,20,16,13,9,6,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,22,11,12,13,11,17,9,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,7,22,25,23,16,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,22,9,12,13,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,9,20,8,17,17,20,19,24,21,12,16,14,12,13,99,99,99,99,99,99,99,99,99,99},{0,24,25,9,20,10,18,14,7,8,11,13,23,26,20,99,99,99,99,99,99,99,99,99,99}},{{8,21,25,22,18,11,7,21,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,21,9,11,10,21,12,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,7,22,10,8,13,18,11,21,23,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,17,11,17,12,20,15,10,21,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{8,12,25,15,19,8,16,16,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,10,20,11,9,11,23,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,26,18,23,23,9,6,10,23,15,9,26,12,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,17,12,17,16,13,12,9,9,19,12,19,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,7,24,13,19,25,16,13,9,15,21,24,19,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,10,20,13,22,11,9,15,17,16,13,8,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,9,25,21,21,10,11,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,17,13,18,23,11,8,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,25,9,10,10,7,7,21,5,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,7,15,18,23,26,18,14,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,12,23,6,16,24,12,22,19,26,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,16,20,21,12,22,20,21,17,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,21,8,12,25,17,15,19,10,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,24,8,15,9,22,12,21,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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{0,9,12,17,11,10,15,17,20,21,20,9,15,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,7,23,15,25,25,21,26,28,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,22,10,17,11,11,20,16,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{9,26,7,22,12,19,24,8,8,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,12,12,21,11,18,8,15,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,17,24,5,13,15,27,9,23,26,6,7,27,4,13,99,99,99,99,99,99,99,99,99,99},{0,12,21,11,12,22,16,12,13,13,20,17,20,14,15,99,99,99,99,99,99,99,99,99,99}},{{9,6,17,5,26,19,15,7,17,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,21,11,14,12,12,14,16,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,27,17,15,17,5,22,18,17,20,12,23,21,21,25,99,99,99,99,99,99,99,99,99,99},{0,23,13,23,17,14,16,21,8,8,7,13,23,19,16,99,99,99,99,99,99,99,99,99,99}},{{9,27,25,14,17,17,6,6,22,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,11,12,12,18,10,19,20,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,24,6,6,23,8,8,23,22,26,24,18,27,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,8,19,16,12,15,13,24,14,21,16,17,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,6,8,26,5,9,22,24,16,4,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,17,11,10,20,20,16,19,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{12,5,15,25,15,27,8,21,18,10,18,8,20,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,17,21,11,11,20,20,11,16,14,12,8,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,24,6,22,25,16,26,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,11,11,10,10,13,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,26,5,26,10,6,12,13,17,22,15,15,6,16,99,99,99,99,99,99,99,99,99,99,99},{0,24,22,9,9,8,22,15,7,24,18,21,25,14,99,99,99,99,99,99,99,99,99,99,99}},{{11,26,6,21,25,6,15,26,9,13,18,21,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,8,21,23,21,11,14,24,20,7,12,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,7,12,21,21,24,24,12,27,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,9,10,21,18,13,22,12,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,27,14,5,10,8,22,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,13,13,19,13,12,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{15,19,17,22,22,26,25,24,7,20,14,7,25,7,28,27,99,99,99,99,99,99,99,99,99},{0,20,14,18,22,25,20,8,15,6,7,11,14,18,14,11,99,99,99,99,99,99,99,99,99}},

{{11,27,26,9,9,6,13,19,16,22,11,19,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,13,12,16,13,12,12,15,11,19,15,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,7,21,24,21,27,20,11,17,26,24,8,11,16,99,99,99,99,99,99,99,99,99,99,99},{0,19,11,13,20,14,23,9,13,17,20,12,12,17,99,99,99,99,99,99,99,99,99,99,99}},{{8,4,7,7,8,26,16,22,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,14,22,17,17,15,17,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,5,7,26,23,23,25,16,12,15,8,16,18,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,9,16,17,14,20,22,23,8,22,11,19,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,7,5,21,26,13,17,20,11,15,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,21,17,17,12,13,13,19,23,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,7,6,17,22,20,13,24,17,25,25,9,20,10,20,99,99,99,99,99,99,99,99,99,99},{0,6,23,15,10,23,15,24,26,8,11,24,16,6,27,99,99,99,99,99,99,99,99,99,99}},{{13,5,7,21,14,25,23,24,13,6,26,9,27,17,99,99,99,99,99,99,99,99,99,99,99},{0,25,6,15,15,11,26,23,12,9,26,10,21,19,99,99,99,99,99,99,99,99,99,99,99}},

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,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,20,9,11,14,16,19,99,99,99,99,99,99,99,99,99,9
9,99,99,99,99,99,99,99,99}}},{{{9,22,7,15,17,18,10,24,18,15,99,99,99,99,99,99,99,99,99,99,99,99,
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9,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{9,8,17,16,9,7,17,24,8,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,15,12,13,22,23,1
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9,99},{0,21,13,16,13,16,10,18,12,19,14,10,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,9,18,9,
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99,99,99,99,99,99,99,99,99,99,99},{0,15,11,13,18,17,6,20,25,11,99,99,99,99,99,99,99,99,99,99,99
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9,99,99,99,99,99,99,99,99,99}}},

{{{11,6,17,13,15,9,16,13,23,26,16,21,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,10,18,21,1
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{{7,15,14,7,6,20,26,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,20,10,20,11,
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99,99,99,99,99}},

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24,99,99,99,99,99,99,99,99,99,99,99,99},{0,6,8,11,5,24,15,20,17,14,6,23,21,18,99,99,99,99,99,99,
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9,99,99,99,99,99,99,99,99,99}},

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19,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,8,23,14,15,17,13,19,17,99,99,99,99,
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1,13,24,14,18,20,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,22,15,9,21,23,11,23,14,1
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9,99,99}},{{9,11,8,8,8,11,19,18,21,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,19,1
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{{18,11,13,9,8,21,11,21,24,20,16,18,22,24,14,24,10,6,16,99,99,99,99,99,99},{0,16,25,6,23,23,10,11,23,7,8,11,20,8,19,12,19,12,22,99,99,99,99,99,99}},{{10,7,7,15,25,14,10,10,19,9,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,9,22,12,13,10,13,12,17,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,6,15,26,19,16,17,16,22,20,7,19,21,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,17,13,21,19,21,10,7,19,8,11,23,12,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,26,5,7,17,20,25,8,18,21,15,6,13,26,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,20,11,13,18,21,20,22,11,19,23,11,13,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,24,5,8,21,24,9,27,24,4,14,17,27,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,11,20,16,8,13,8,18,14,16,18,20,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,23,7,6,9,23,20,25,9,13,16,25,4,16,22,99,99,99,99,99,99,99,99,99,99,99},{0,9,11,21,15,17,18,21,19,18,19,12,14,16,12,99,99,99,99,99,99,99,99,99,99,99}},{{12,19,8,25,23,6,10,15,6,20,13,23,11,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,17,23,11,8,11,14,11,15,10,14,7,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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9,99,99,99,99,99,99},{0,16,12,15,13,20,14,14,14,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{15,8,4,23,27,21,16,24,5,11,13,8,26,20,15,14,99,99,99,99,99,99,99,99,99,99},{0,14,7,12,24,17,14,15,10,13,10,18,10,8,17,7,99,99,99,99,99,99,99,99,99,99}},{{9,20,25,27,7,12,16,6,7,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,11,23,15,13,15,10,18,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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{{16,18,21,13,13,24,5,19,8,9,26,17,14,14,19,8,21,99,99,99,99,99,99,99,99},{0,6,22,26,19,13,21,10,16,10,9,16,14,22,13,19,6,99,99,99,99,99,99,99,99}}},{{{15,26,27,9,18,14,4,15,18,23,10,19,11,16,19,22,99,99,99,99,99,99,99,99,99},{0,9,21,15,12,13,15,16,18,21,18,21,21,22,8,12,99,99,99,99,99,99,99,99,99}},{{13,7,16,27,23,13,12,8,6,18,20,21,27,24,99,99,99,99,99,99,99,99,99,99,99},{0,14,12,10,13,17,12,19,10,18,22,18,13,16,99,99,99,99,99,99,99,99,99,99,99}},{{10,6,21,20,5,23,24,16,25,9,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,25,10,13,13,8,8,17,18,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,7,6,27,24,9,10,11,12,18,14,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,8,14,14,18,9,23,20,21,11,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,6,24,6,23,9,15,12,17,24,27,9,11,17,28,99,99,99,99,99,99,99,99,99,99},{0,20,24,7,13,12,20,13,13,9,15,15,7,16,18,99,99,99,99,99,99,99,99,99,99}},{{12,13,5,8,7,26,8,17,11,14,13,19,20,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,12,9,20,13,14,15,14,18,9,10,16,99,99,99,99,99,99,99,99,99,99,99,99}},

{{12,5,12,27,11,20,16,14,17,9,14,22,19,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,14,22,23,20,18,22,12,9,9,23,24,99,99,99,99,99,99,99,99,99,99,99,99}},{{16,13,14,5,5,6,6,17,25,26,18,25,10,9,12,14,15,99,99,99,99,99,99,99,99},{0,20,13,8,11,19,22,20,10,22,13,25,22,7,25,8,23,99,99,99,99,99,99,99,99}},{{11,25,24,6,7,23,23,9,10,15,18,27,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,23,10,19,13,18,12,18,14,12,20,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,6,5,24,7,25,26,22,28,14,8,13,17,19,99,99,99,99,99,99,99,99,99,99,99},{0,11,20,16,14,13,20,21,15,18,20,15,16,22,99,99,99,99,99,99,99,99,99,99,99}},{{10,10,26,25,17,12,6,7,25,10,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,9,24,13,16,21,6,27,5,6,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,24,6,22,25,27,12,6,27,9,12,15,16,28,99,99,99,99,99,99,99,99,99,99,99},{0,21,11,14,10,14,11,14,20,16,14,12,16,17,99,99,99,99,99,99,99,99,99,99,99}},{{16,25,14,10,21,7,6,25,19,25,6,10,14,15,19,19,20,99,99,99,99,99,99,99,99},{0,23,18,13,12,9,15,7,16,11,18,7,21,24,21,25,6,99,99,99,99,99,99,99,99}},

{{11,5,6,25,26,15,26,6,16,8,7,15,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,8,11,23,12,20,11,19,21,24,7,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{16,23,5,8,9,6,11,26,26,24,11,13,13,16,16,16,17,99,99,99,99,99,99,99,99},{0,14,16,9,17,19,12,13,18,9,7,18,23,8,12,23,18,99,99,99,99,99,99,99,99}},{{11,9,13,27,4,8,18,10,26,7,11,20,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,15,12,12,21,15,18,15,10,10,10,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,23,20,18,25,9,15,9,25,16,25,8,13,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,12,18,24,8,11,14,20,14,10,11,21,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,26,4,26,21,7,10,7,15,11,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,12,23,14,9,13,18,16,9,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,6,11,21,11,25,22,27,5,24,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,14,17,10,11,21,15,16,15,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,26,6,5,9,10,8,22,9,14,16,19,19,99,99,99,99,99,99,99,99,99,99,99,99},{0,17,25,6,17,12,7,16,22,12,15,13,19,99,99,99,99,99,99,99,99,99,99,99,99}},

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{{17,25,8,5,15,9,18,25,13,15,18,8,16,11,26,23,18,4,99,99,99,99,99,99,99},{0,7,10,8,11,17,11,11,18,23,23,7,16,9,15,22,26,11,99,99,99,99,99,99,99}},{{10,17,8,19,23,27,7,21,23,14,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,26,16,4,7,10,11,21,18,8,12,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,5,26,22,8,8,10,24,20,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,9,11,10,21,24,14,19,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,14,21,25,4,16,10,19,10,6,28,21,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,23,12,24,12,10,13,13,21,11,8,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,8,17,9,28,4,12,7,23,13,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,12,12,10,21,23,15,11,19,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,16,12,15,13,16,4,27,22,18,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,20,9,14,12,17,20,21,15,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,4,27,11,15,17,14,6,14,14,22,7,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,20,23,19,9,9,20,22,14,8,9,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{15,6,21,22,7,6,26,23,9,9,12,15,20,23,25,27,99,99,99,99,99,99,99,99,99},{0,9,26,17,18,14,6,13,10,14,14,18,21,9,21,13,99,99,99,99,99,99,99,99,99}},{{13,9,5,19,8,8,8,22,22,24,26,12,16,20,99,99,99,99,99,99,99,99,99,99,99},{0,18,24,7,8,21,11,9,18,13,17,22,18,22,99,99,99,99,99,99,99,99,99,99,99}},{{11,27,9,20,17,16,13,18,4,8,15,21,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,1

6,10,11,24,10,15,8,9,20,6,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,5,23,19,25,10,15,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,10,23,7,10,8,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,27,10,17,7,10,23,5,13,22,13,16,14,10,9,99,99,99,99,99,99,99,99,99,99,99},{0,7,23,11,11,9,23,23,10,9,17,16,20,12,26,99,99,99,99,99,99,99,99,99,99,99}},{{14,4,27,22,26,10,17,13,26,18,20,21,9,11,14,99,99,99,99,99,99,99,99,99,99,99},{0,24,6,18,18,10,11,7,9,8,11,22,26,21,25,99,99,99,99,99,99,99,99,99,99,99}},{{14,5,9,23,8,21,10,24,11,26,27,15,20,13,17,99,99,99,99,99,99,99,99,99,99,99},{0,16,14,12,18,19,10,16,20,12,17,10,22,13,19,99,99,99,99,99,99,99,99,99,99,99}},

{{8,16,8,19,4,10,26,10,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,13,13,11,19,11,22,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{15,26,15,16,19,6,13,9,16,4,18,21,21,6,22,8,99,99,99,99,99,99,99,99,99,99},{0,22,18,15,10,21,14,22,9,16,19,17,13,24,9,16,99,99,99,99,99,99,99,99,99,99}},{{11,26,13,26,6,16,19,7,12,7,17,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,12,23,12,14,12,17,16,20,8,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,5,14,19,15,22,23,16,25,8,10,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,13,21,10,8,20,16,12,20,15,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,9,8,27,5,7,14,17,20,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,8,14,24,19,14,18,13,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,24,14,6,10,16,27,24,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,10,21,21,22,12,14,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,6,7,26,20,15,11,7,10,14,19,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,10,15,16,13,11,24,18,22,21,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{13,5,26,24,17,20,22,19,19,11,8,14,23,20,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,11,20,15,15,11,19,9,9,23,21,14,23,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,24,8,26,5,12,20,15,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,11,8,23,17,17,15,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,27,11,4,7,19,23,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,15,20,12,14,12,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,23,15,16,23,25,15,13,10,13,7,6,6,17,26,99,99,99,99,99,99,99,99,99,99,99},{0,18,6,12,12,8,25,19,16,15,17,13,10,16,17,99,99,99,99,99,99,99,99,99,99,99}}},{{{12,15,25,5,13,24,16,9,16,16,26,20,19,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,20,17,16,11,12,17,19,15,23,13,22,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,26,23,18,14,17,7,18,7,7,9,23,23,27,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,13,13,13,18,17,21,14,11,20,16,19,14,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,9,18,22,25,8,25,21,10,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,23,10,10,14,16,22,11,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{11,6,24,22,7,25,18,7,10,22,10,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,11,14,14,14,20,19,21,17,14,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,26,21,15,23,18,8,5,13,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,20,13,13,13,12,18,19,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,8,25,9,5,15,16,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,14,14,18,20,16,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,6,20,17,22,18,20,25,24,25,9,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,21,17,10,9,17,23,13,10,13,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,8,24,15,7,15,23,19,17,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,23,19,19,11,10,11,22,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,24,19,21,10,12,22,7,10,19,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},

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9,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,10,24,15,9,20,10,6,99,99,99,99,99,99,99,99,99,99,
99,99,99,99,99}},{{10,25,13,7,24,7,15,18,17,18,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99},
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99,99,99,99,99,99,99,99,99,99,99,99}},{{9,17,6,5,8,6,20,14,15,10,99,99,99,99,99,99,99,99,99,9
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}},{{7,26,5,15,8,8,9,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,12,13,14,17,
20,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,11,5,14,15,5,15,15,18,9,99,99,
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16,16,27,23,11,99,99,99,99,99,99,99,99,99,99,99},{0,20,22,16,15,23,13,10,8,17,14,20,23,19,99
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99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,17,10,20,11,17,13,17,99,99,99,99,99,99,99,99,9
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{{11,8,8,15,9,23,18,22,13,18,8,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,13,23,9,18,21,12,8,8,19,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,9,18,10,10,24,16,13,13,11,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,12,20,12,13,20,10,20,23,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,20,24,10,20,7,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,22,21,11,14,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,17,9,20,10,17,19,21,11,23,7,11,24,10,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,8,11,11,14,19,22,18,10,14,21,23,14,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,12,9,21,21,23,24,16,12,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,20,11,20,14,19,17,15,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,10,10,22,13,9,10,9,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,18,19,17,23,8,11,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,21,15,16,19,23,8,9,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,9,22,10,14,9,21,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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9,21,99,99,99,99,99,99,99,99,99,99}},

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,99,99,99,99,99}},

{{8,6,15,5,5,25,20,23,28,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,20,13,22,9,20,
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18,24,13,15,15,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,24,9,26,14,15,8,6,25,20,8,18,99,
99,99,99,99,99,99,99,99,99,99,99,99}},{{11,21,25,23,14,10,17,6,9,12,17,18,99,99,99,99,99,99,9
9,99,99,99,99,99,99},{0,19,20,8,12,12,21,23,22,23,9,16,99,99,99,99,99,99,99,99,99,99,99,99,9
9}},{{10,19,26,7,8,21,22,16,5,10,6,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,16,13,23,22
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9,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,9,21,20,9,18,11,12,21,99,99,99,99,99,99,99,99,9
9,99,99,99,99,99,99}},

{{15,23,18,26,21,7,15,6,7,11,26,23,9,15,26,10,99,99,99,99,99,99,99,99,99},{0,17,14,23,20,12,2
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9,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,9,20,14,12,22,19,19,12,17,99,99,99,99,99,99,99,99,
99,99,99,99,99,99}},{{10,7,8,20,25,20,24,10,15,23,6,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99
},{0,12,21,21,17,10,21,13,18,12,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,6,8,14,6,25
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9,99,99,99,99,99,99,99,99},{0,8,11,23,16,22,20,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,
99,99}},{{9,19,24,6,9,14,12,15,19,27,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,16,9,
22,12,20,19,19,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,7,24,24,8,11,15,17,14,1
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9,99,99,99,99,99,99,99,99}},

{{8,11,17,7,24,26,7,19,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,17,16,23,22,9,1
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{{11,8,24,13,25,21,14,17,20,6,8,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,11,21,15,21,13,12,11,19,15,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,14,24,7,14,17,6,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,14,14,15,15,19,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,12,12,18,13,6,25,21,18,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,12,20,22,17,22,21,10,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,14,23,25,13,8,8,21,14,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,10,21,18,10,20,20,14,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,23,9,7,23,15,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,17,14,17,21,15,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,24,5,10,18,22,27,27,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,14,17,18,18,14,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,24,7,25,11,9,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,19,22,12,16,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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{{8,25,13,8,25,22,19,6,6,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,12,13,18,20,20,17,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{4,24,7,9,6,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,22,17,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,14,6,24,9,24,8,19,27,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,19,16,21,13,10,20,15,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,23,12,11,19,17,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,11,22,19,12,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,7,22,10,25,18,14,20,19,25,99,99,99,99,99,99,9

9,99,99,99,99,99,99,99,99,99},{0,7,20,23,9,14,14,23,17,21,99,99,99,99,99,99,99,99,99,99,99,9
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99,99,99,99,99,99,99,99,99,99,99,99}},

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18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,25,17,13,6,6,14,11,17,23,20,26,99,9
9,99,99,99,99,99,99,99,99,99,99,99},{0,8,11,11,10,20,14,15,14,20,17,23,99,99,99,99,99,99,99,
99,99,99,99,99,99}},{{7,25,25,6,24,25,12,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,9
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23,14,99,99,99,99,99,99,99,99,99,99,99}},

{{13,10,13,19,23,22,11,19,25,22,20,25,7,26,99,99,99,99,99,99,99,99,99,99,99},{0,12,11,9,8,20,
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9,99,99,99,99,99,99,99,99}},{{9,5,15,10,8,25,15,13,18,10,99,99,99,99,99,99,99,99,99,99,99,99,
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1,13,18,16,20,25,6,14,21,16,24,9,7,99,99,99,99,99,99,99,99,99,99,99},{0,19,20,23,8,15,17,23,14,9
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{{4,23,13,25,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,14,19,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,24,7,19,23,7,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,17,18,17,12,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,15,23,7,11,6,25,19,19,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,23,19,11,9,8,9,17,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{4,25,23,6,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,22,10,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,22,9,6,22,23,10,19,13,16,16,26,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,25,11,21,16,6,21,14,10,10,23,6,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,25,13,21,6,16,14,22,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,13,19,22,12,21,22,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,6,15,6,7,11,15,23,26,23,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,8,17,21,22,22,11,12,17,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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0,24,8,10,10,14,15,9,11,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,6,23,9,24,12,18,
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,{{9,6,16,20,25,11,16,26,23,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,20,19,11,1
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9,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,16,16,12,19,21,20,10,19,99,99,99,99,99,99,99
,99,99,99,99,99,99,99,99}},

{{14,24,14,8,25,20,21,7,16,18,23,24,17,12,24,99,99,99,99,99,99,99,99,99,99},{0,9,13,24,19,24,
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5,6,24,16,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,13,6,25,11,21,15,13,99,9
9,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{9,15,25,6,18,9,14,17,25,21,99,99,99,99,99,9
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99,99,99,99}},{{10,25,8,25,15,17,18,25,9,20,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,
8,11,13,11,22,10,18,16,21,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,22,23,10,23,6,20
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99,99},{0,20,12,12,12,15,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,25,22
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{{10,12,26,6,25,20,18,21,16,9,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,21,10,9,9,15,
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13,11,20,16,20,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,20,17,26,23,13,6,8,16,20,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,19,23,12,20,16,11,22,21,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{10,6,22,17,14,8,8,25,22,15,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,22,10,12,12,17,8,9,15,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,7,21,12,25,22,24,17,15,9,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,21,10,18,13,22,19,14,13,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{5,25,8,8,6,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,15,18,11,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,19,17,24,23,6,8,14,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,21,12,18,22,9,21,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,23,8,6,10,15,18,21,14,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,23,8,8,21,20,18,10,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,11,24,23,9,18,17,20,19,8,26,19,13,21,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,8,21,25,13,24,24,9,6,20,16,7,13,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,20,24,13,25,16,6,9,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,18,16,10,14,11,19,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{7,5,12,15,6,26,21,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,14,15,11,17,16,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,21,25,9,6,12,23,15,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,21,17,10,18,16,16,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{8,15,18,10,17,15,23,23,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,17,15,13,19,20,11,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,16,24,22,10,15,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,15,11,13,17,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,8,23,15,24,19,11,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,15,10,18,10,18,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,23,9,16,9,13,21,10,23,18,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,12,21,15,11,20,20,13,10,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,8,22,11,14,17,23,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,13,13,13,14,21,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{7,18,15,10,17,23,17,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,15,13,21,13,18,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,18,23,18,23,10,11,20,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,12,19,15,18,21,22,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,22,17,17,22,8,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,12,19,12,12,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{5,20,12,22,11,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,14,11,18,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,11,8,11,23,15,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,21,11,16,17,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,12,12,15,20,23,22,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,17,15,14,12,17,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,9,22,20,23,13,17,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,20,13,11,14,13,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{8,12,11,21,20,20,15,17,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,13,9,22,16

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,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,22,9,16,17,20,19,99,99,99,99,99,99,99,99,9
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99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,21,19,12,11,19,11,19,99,99,99,99,99,99,99,9
9,99,99,99,99,99,99,99,99,99}},{{6,10,23,20,13,9,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99
,99,99,99},{0,10,12,14,11,21,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,1
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{{6,17,22,23,19,9,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,11,20,12,19
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,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,16,20,11,15,99,99,99,99,99,99,99,99,99,99,
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23,23,9,10,14,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,13,14,19,13,15

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{{7,10,10,13,10,20,19,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,11,20,10,14,12,19,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,23,8,14,16,11,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,12,14,20,14,14,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,20,19,10,9,17,20,12,22,12,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,17,20,17,13,10,13,12,22,20,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,18,15,11,10,22,18,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,12,11,17,10,10,16,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,9,21,20,22,12,13,21,13,16,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,17,18,11,15,15,12,21,18,12,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,11,22,11,17,10,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,9,17,17,16,22,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,9,13,22,11,16,20,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,19,21,17,11,20,12,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{7,9,12,21,18,17,12,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,21,11,13,10,16,19,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,11,14,22,19,20,11,16,14,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,10,15,19,14,10,22,11,22,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,9,22,13,11,22,18,12,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,21,22,16,13,10,16,19,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,22,16,8,9,12,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,15,15,21,9,15,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,20,10,12,18,10,21,15,21,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,21,19,15,14,10,16,14,12,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{7,15,23,18,9,16,23,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,19,11,19,18,15,20,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,9,22,13,16,20,22,13,19,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,12,11,15,13,19,14,18,22,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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{{10,16,20,11,10,21,20,16,17,14,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,17,16,20,20,13,19,11,12,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,10,17,10,20,22,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,13,14,11,21,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,10,20,17,13,23,19,21,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,17,17,14,16,12,20,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{5,9,21,11,17,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,14,17,15,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,10,11,14,20,13,16,19,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,13,12,14,19,19,18,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,12,22,19,9,15,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,13,15,13,18,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,22,15,20,9,11,20,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,15,13,21,10,16,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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99,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,15,13,16,20,20,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,15,17,20,18,9,20,22,23,16,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,19,20,16,16,10,13,21,22,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,9,19,10,16,22,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,19,11,13,11,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{5,14,21,22,14,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,18,12,18,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,12,10,21,21,9,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,18,17,11,21,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,18,11,23,11,22,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,17,20,13,11,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{4,18,21,20,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,12,20,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,13,11,17,20,18,18,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,13,12,9,16,19,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{5,21,11,17,16,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,17,23,12,21,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,14,18,11,22,12,21,18,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,20,14,15,11,18,10,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{4,15,9,16,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,15,15,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,16,17,19,14,21,10,20,10,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,19,16,11,12,15,21,18,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,22,15,11,16,22,12,16,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,13,15,16,21,18,19,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{6,10,20,14,23,19,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,18,14,19,11,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{5,23,11,11,17,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,17,11,15,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,9,20,11,15,12,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,13,11,20,20,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,22,10,9,13,17,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,11,20,12,17,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,16,9,19,21,21,12,16,12,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,21,15,19,11,9,22,22,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,9,11,15,18,21,22,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,19,14,13,16,19,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{5,11,23,8,8,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,16,12,19,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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9,99,99,99,99,99,99,99,99,99,99},{0,8,8,10,16,18,19,23,17,15,20,99,99,99,99,99,99,99,99,99,99,99,9
9,99,99,99}},{{9,7,15,25,23,6,17,26,9,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,2
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9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,20,12,10,10,12,12,99,99,99,99,99,99,99
,99,99,99,99,99,99,99,99,99,99,99}},

{{16,17,11,16,23,19,23,6,10,23,20,23,9,26,13,9,13,99,99,99,99,99,99,99,99},{0,17,23,24,24,22,
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99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,22,11,9,22,11,21,21,99,99,99,99,99,99,99,99,99,99,
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5,25,20,17,13,10,16,15,99,99,99,99,99,99,99,99,99,99},{0,23,16,7,22,10,25,7,24,16,19,9,9,10,2
2,99,99,99,99,99,99,99,99,99,99}},

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99,99,99,99,99,99,99,99,99,99,99,99,99},{0,25,10,18,10,13,19,23,20,24,8,15,21,99,99,99,99,99,99
,99,99,99,99,99,99}},{{10,6,18,25,16,9,14,13,10,7,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,9
9},{0,9,11,9,21,11,11,20,20,22,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{16,21,21,23,2
6,24,8,8,20,11,6,24,9,13,14,15,26,99,99,99,99,99,99,99,99},{0,17,20,23,24,17,9,18,10,21,12,11
,12,24,10,21,20,99,99,99,99,99,99,99,99}},{{12,25,14,6,17,25,8,14,9,18,11,19,18,99,99,99,99,9
9,99,99,99,99,99,99,99,99},{0,23,10,8,20,8,22,22,10,10,20,16,13,99,99,99,99,99,99,99,99,99,99,9
9,99}},{{14,11,20,9,18,22,12,6,6,18,21,15,15,9,22,99,99,99,99,99,99,99,99,99,99},{0,22,9,12,20
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9,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,23,16,14,17,99,99,99,99,99,99,99,99,99,99,99,
99,99,99,99,99,99,99,99}},

{{7,6,6,21,21,25,25,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,22,11,20,12,1
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99,99,99,99,99,99}},{{16,8,24,24,8,12,20,17,8,20,16,15,10,11,14,19,20,99,99,99,99,99,99,99,99
},{0,6,20,10,17,16,11,21,25,22,8,13,9,22,26,17,14,99,99,99,99,99,99,99,99}},{{8,26,6,25,12,19,
6,14,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,24,23,8,16,16,9,13,11,99,99,99,9
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9,99,99,99,99,99,99,99},{0,15,23,16,8,16,26,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,
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9,22,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{10,7,25,17,17,25,25,10,20,21,14
,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,21,17,12,24,8,14,18,11,15,99,99,99,99,99,9
9,99,99,99,99,99,99,99,99,99}},

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{{6,6,26,26,6,9,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,17,14,17,14,13,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,23,24,6,8,27,24,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,15,18,15,13,18,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,14,17,25,7,6,25,7,25,6,14,25,26,10,99,99,99,99,99,99,99,99,99,99,99},{0,11,11,10,19,8,19,11,22,22,14,25,7,7,99,99,99,99,99,99,99,99,99,99,99}},{{6,24,6,26,24,7,27,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,10,10,23,13,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,24,7,7,24,19,23,24,13,11,14,17,19,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,7,24,22,15,15,25,9,21,20,10,18,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,6,25,24,6,13,18,6,6,25,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,9,23,8,11,21,11,25,12,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,25,24,25,8,8,21,8,21,18,12,12,15,15,99,99,99,99,99,99,99,99,99,99,99},{0,12,19,16,10,21,10,13,22,7,22,9,10,21,99,99,99,99,99,99,99,99,99,99,99}},

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{{13,8,8,22,8,22,18,18,16,12,10,8,11,19,99,99,99,99,99,99,99,99,99,99,99},{0,25,15,20,7,12,12,20,16,15,18,10,25,16,99,99,99,99,99,99,99,99,99,99,99}},{{13,24,25,8,24,12,18,6,6,8,11,26,25,15,99,99,99,99,99,99,99,99,99,99,99},{0,10,20,13,23,17,15,9,24,21,20,7,26,18,99,99,99,99,99,99,99,99,99,99,99}},{{11,25,6,7,6,14,18,9,13,26,7,17,99,99,99,99,99,99,99,99,99,99,99,99,99},{

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9,99,99,99,99,99,99,99,99,99,99,99}}},{{{13,7,17,26,17,24,26,26,20,10,20,13,27,13,99,99,99,99,99
,99,99,99,99,99,99},{0,16,17,7,12,20,11,25,11,14,18,15,18,19,99,99,99,99,99,99,99,99,99,99,99,9
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0,10,22,19,19,23,23,20,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,7,11,25,15,8,8,11,21,6,25,1
9,12,18,18,99,99,99,99,99,99,99,99,99,99},{0,23,23,14,7,10,19,8,23,13,20,9,12,6,12,99,99,99,9
9,99,99,99,99,99,99}},

{{10,7,24,24,7,6,21,25,9,13,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,8,12,9,18,21,1
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18,9,6,26,14,10,99,99,99,99,99,99,99,99,99,99,99},{0,6,25,11,20,9,12,22,21,24,10,6,11,20,99,9
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,18,26,24,14,99,99,99,99,99,99,99,99,99},{0,9,21,9,12,12,19,12,21,18,21,10,15,22,19,15,21,99,99,
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26,6,10,20,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,11,7,25,21,12,17,11,14,7,20,99,99,9
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{{7,15,26,14,6,8,6,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,11,12,9,12,21,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,11,16,17,24,19,8,22,8,25,23,26,13,18,99,99,99,99,99,99,99,99,99,99,99},{0,22,22,17,16,20,18,20,14,20,23,13,12,12,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,26,6,26,14,17,17,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,10,21,21,12,12,20,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,25,25,23,8,8,23,6,6,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,10,17,14,17,14,10,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,6,21,24,25,22,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,10,16,21,13,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,26,26,6,18,13,15,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,10,21,20,13,12,16,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{4,25,6,23,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,10,12,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{9,26,26,14,20,6,6,6,12,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,11,16,15,9,22,12,20,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,6,26,26,6,13,18,16,6,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,11,21,9,12,19,13,12,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,23,22,24,7,8,10,25,26,13,13,18,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,19,16,20,17,12,19,12,10,19,12,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,26,6,15,9,19,8,13,16,16,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,9,11,11,11,18,19,21,17,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,25,23,7,9,22,7,14,17,28,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,17,15,19,11,12,11,10,21,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,26,26,15,6,8,18,11,18,13,18,6,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,21,12,9,12,12,22,15,19,19,19,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,10,21,21,24,10,25,9,12,18,26,10,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,10,20,15,9,20,12,12,19,12,24,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{5,7,6,26,8,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,23,15,14,17,99,9

9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,6,6,22,24,22,22,27,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,10,21,12,16,22,19,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,6,20,26,6,7,15,11,12,14,12,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,9,15,16,22,12,19,11,19,11,14,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{16,6,6,17,6,26,26,14,14,18,7,20,9,13,12,18,22,99,99,99,99,99,99,99,99,99}},{0,9,22,20,15,19,13,12,16,12,18,16,22,19,24,8,23,99,99,99,99,99,99,99,99,99}},{{8,26,6,12,19,26,6,15,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,10,21,16,16,22,10,18,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,26,6,14,6,18,9,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,15,10,16,22,15,12,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,25,7,6,8,26,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,22,9,22,18,9,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},

{{{10,10,25,25,18,6,18,21,21,6,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,15,8,23,13,14,18,11,20,17,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,14,23,25,6,8,17,15,8,23,24,20,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,12,12,9,9,12,12,20,18,18,21,20,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,11,20,8,7,24,22,11,8,23,18,11,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,22,23,19,11,18,9,11,14,12,9,25,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,25,9,21,8,23,11,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,9,9,11,22,17,17,20,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,15,24,6,25,17,9,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,21,20,22,10,10,12,12,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,6,15,25,6,14,9,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,21,20,10,10,12,12,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{17,17,11,16,19,24,8,23,9,9,22,25,12,11,9,12,19,23,99,99,99,99,99,99,99}},{0,17,22,23,20,23,19,20,12,9,9,12,9,25,15,12,12,16,99,99,99,99,99,99,99}},

{{8,6,6,25,25,14,17,17,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,9,22,9,22,11,11,20,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{2,6,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,15,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,6,21,25,23,24,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,20,10,11,18,15,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,25,13,25,6,17,14,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,9,9,11,22,21,13,16,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{3,6,24,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,10,21,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,25,25,6,6,6,20,25,12,12,15,18,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,7,24,6,9,25,16,15,8,23,22,7,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,6,25,6,25,12,18,6,15,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,22,9,8,23,11,20,11,12,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{9,25,25,24,24,8,10,21,21,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,11,20,14,17,18,11,11,20,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,25,6,15,9,11,15,19,6,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,9,9,11,11,23,22,11,20,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,23,26,7,7,21,19,24,11,12,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{0,21,22,20,14,14,20,18,10,22,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,25,25,6,18,18,9,17,14,8,13,9,13,99,99,99,99,99,99,99,99,99,99,99,99}},{0,22,9,9,11,16,11,19,11,18,1

9,22,22,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,21,11,24,10,20,9,12,7,24,24,24,16,8,99,99,99,99,99,99,99,99,99,99,99},{0,9,22,21,9,23,12,12,21,10,14,18,20,18,99,99,99,99,99,99,99,99,99,99,99}},{{5,7,6,25,8,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,23,15,14,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{5,6,6,22,24,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,9,20,14,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{9,6,6,25,20,12,15,16,9,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,23,17,16,10,11,20,22,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,6,6,24,24,7,13,18,18,16,12,10,14,18,18,99,99,99,99,99,99,99,99,99,99,99},{0,26,15,21,10,6,16,10,21,16,24,9,5,6,25,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,25,6,12,19,25,6,15,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,10,16,16,22,22,18,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,25,6,14,6,18,7,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,22,16,9,15,25,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,7,24,25,6,8,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,23,9,22,18,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{11,19,26,26,5,22,22,14,11,15,12,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,20,11,16,14,18,16,16,19,20,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,7,14,24,26,5,17,15,7,23,12,18,18,26,99,99,99,99,99,99,99,99,99,99,99},{0,14,14,14,11,11,14,19,20,18,18,18,21,20,99,99,99,99,99,99,99,99,99,99,99}},

{{8,12,19,8,8,26,26,23,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,21,14,18,13,19,14,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,26,5,7,24,7,8,24,27,20,11,11,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,11,14,17,20,17,20,18,20,20,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,5,15,25,14,24,26,5,7,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,18,19,15,15,12,12,15,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,26,5,15,14,5,7,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,19,18,15,12,15,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,11,26,17,24,7,9,17,20,6,27,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,21,17,14,20,13,21,18,11,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,5,5,26,26,14,17,17,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,20,11,20,13,13,18,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{2,5,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{3,5,26,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,17,13,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,5,5,26,18,26,13,14,21,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,11,11,15,20,13,17,14,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{4,5,24,26,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,15,12,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,26,26,26,5,5,20,14,15,19,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,21,16,10,22,16,20,11,19,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,5,26,5,26,14,17,20,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,11,11,20,13,18,19,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,26,24,7,9,8,23,6,27,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,14,11,18,14,21,20,13,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,26,14,5,7,17,1

4,6,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,14,11,14,14,20,19,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{7,26,7,21,21,8,7,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,17,14,17,13,20,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,26,26,17,5,6,10,7,8,13,16,21,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,20,14,11,19,18,16,13,13,17,18,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,21,10,9,26,23,14,26,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,20,13,13,18,12,18,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{5,26,6,5,8,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,11,20,18,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,5,5,24,23,26,27,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,20,14,18,18,13,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{15,5,5,26,18,14,10,11,21,15,8,9,13,18,18,22,99,99,99,99,99,99,99,99,99,99},{0,11,20,17,16,16,12,19,17,19,9,22,10,11,20,12,99,99,99,99,99,99,99,99,99,99}},{{20,5,5,26,26,5,15,16,18,19,12,8,21,9,9,21,8,12,14,19,21,99,99,99,99},{0,24,8,19,11,15,16,12,19,13,20,16,20,9,12,16,25,7,24,8,23,99,99,99,99}},

{{9,5,11,26,5,26,21,15,20,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,16,11,11,20,15,17,18,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,5,26,5,13,8,9,16,6,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,16,11,16,12,19,17,23,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,25,5,26,7,24,12,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,20,20,11,16,15,16,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{10,25,25,18,18,21,6,10,21,13,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,24,12,19,21,15,16,11,16,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,14,25,6,17,7,24,15,18,7,22,12,25,23,18,99,99,99,99,99,99,99,99,99,99,99},{0,11,8,8,11,11,11,21,20,20,20,20,18,23,23,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,8,23,15,21,24,8,11,8,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,23,10,11,17,10,11,14,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,25,6,7,24,8,23,13,18,13,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,7,10,10,18,18,23,23,20,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{9,15,14,17,25,6,8,6,25,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,12,12,10,10,13,22,22,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,15,25,14,17,6,8,6,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,10,12,12,10,13,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,16,8,23,25,6,7,16,21,10,26,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,24,23,22,14,13,17,17,11,11,23,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,25,6,25,14,17,17,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,23,8,8,10,10,21,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{2,6,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{3,6,24,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,16,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,25,25,13,18,6,15,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,9,22,11,11,21,14,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{4,6,25,25,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,10,21,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,25,25,6,6,18,22,12,13,16,15,

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{{14,23,8,10,23,18,14,25,6,13,7,19,22,26,17,99,99,99,99,99,99,99,99,99,99,99},{0,9,22,11,20,19,13,12,14,9,18,23,23,20,12,99,99,99,99,99,99,99,99,99,99,99}},{{5,25,7,6,6,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,16,7,24,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,6,6,25,22,25,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,22,12,20,18,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,6,6,25,21,11,16,9,12,14,16,19,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,24,15,16,11,13,21,23,9,18,11,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,23,23,12,8,9,18,18,8,13,14,16,16,19,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,11,15,16,5,21,10,27,25,18,13,24,13,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,25,6,6,19,12,25,15,15,10,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,23,9,16,16,9,14,18,20,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,6,25,13,16,16,10,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,23,15,15,15,18,20,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{6,6,8,25,24,6,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,19,9,12,8,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{9,26,26,9,18,18,6,22,21,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,6,25,16,12,19,15,22,10,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,6,26,14,17,9,15,22,7,12,8,19,25,23,23,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,8,10,10,10,22,22,22,21,19,22,22,25,18,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,9,23,25,22,9,14,18,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,24,24,20,10,15,10,10,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,6,26,9,23,11,9,21,26,9,15,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,6,6,8,19,24,21,22,18,17,22,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,15,25,6,26,14,17,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,21,22,9,9,11,11,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,6,16,26,6,15,18,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,21,9,9,11,11,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{11,8,24,25,22,16,10,9,9,14,17,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,24,23,20,11,24,8,15,20,10,10,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,6,26,26,14,17,17,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,23,7,23,9,9,22,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{2,6,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,6,6,24,9,24,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,13,11,19,17,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,6,26,17,16,6,26,19,99,99,99,99,99,99,99,99,99,99,9

9,99,99,99,99,99,99,99,99},{0,8,8,14,10,23,24,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{3,6,25,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,22,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,7,7,22,12,12,25,25,14,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,25,6,16,8,23,6,25,20,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{6,6,6,26,20,11,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,8,24,22,10,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,25,25,21,9,22,9,9,9,14,14,17,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,13,25,24,9,10,14,18,9,23,23,9,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,26,6,17,20,9,8,17,9,17,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,8,10,10,10,19,19,23,22,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,23,24,11,6,18,17,6,26,8,27,9,8,12,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,25,7,10,7,22,13,20,21,23,10,17,21,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,26,26,6,17,20,9,21,21,8,9,16,11,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,23,8,10,20,10,10,17,19,23,24,20,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,8,23,8,22,15,11,16,25,16,25,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,9,12,21,13,11,17,13,20,22,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{5,7,6,26,8,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,23,15,14,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{7,6,6,23,23,25,19,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,23,21,11,18,11,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,6,22,26,6,12,12,10,17,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,25,15,16,7,22,11,7,10,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{15,23,23,12,9,18,19,10,13,16,8,12,15,15,19,18,99,99,99,99,99,99,99,99,99,99},{0,20,11,16,16,21,10,26,25,24,5,6,7,13,24,13,99,99,99,99,99,99,99,99,99,99}},{{12,26,6,18,12,6,15,26,15,10,22,11,19,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,24,23,16,16,9,14,7,18,20,11,12,19,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,26,6,15,6,18,19,13,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,24,16,8,15,18,12,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,24,23,8,19,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{15,26,26,26,26,17,17,5,10,20,20,13,12,9,20,12,99,99,99,99,99,99,99,99,99,99},{0,6,19,11,25,18,12,15,15,12,18,15,18,18,21,11,99,99,99,99,99,99,99,99,99,99}},

{{15,5,26,15,15,15,7,25,8,23,8,18,24,8,18,18,99,99,99,99,99,99,99,99,99,99},{0,8,8,18,13,21,18,21,12,12,9,20,18,22,23,13,99,99,99,99,99,99,99,99,99,99}},{{14,10,22,6,24,8,7,24,21,24,25,10,18,13,14,99,99,99,99,99,99,99,99,99,99,99},{0,22,23,23,20,10,15,15,12,10,23,13,9,9,12,99,99,99,99,99,99,99,99,99,99,99}},{{14,5,26,24,7,15,23,6,25,8,10,20,6,9,12,99,99,99,99,99,99,99,99,99,99,99},{0,7,7,12,12,22,20,17,17,8,24,24,20,19,20,99,99,99,99,99,99,99,99,99,99,99}},{{10,6,26,9,26,24,7,15,15,18,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,8,21,23,13,13,17,13,19,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,25,13,5,18,26,5,24,7,15,9,8,18,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,17,20,9,20,9,22,14,14,14,23,10,15,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{17,6,9,17,17,24,24,8,23,26,17,19,12,8,13,18,23,27,99,99,99,99,99,99,99,99},{0,23,22,20,23,20,23,12,12,11,26,8,8,15,11,11,15,20,99,99,99,99,99,99,99,99}},{{14,5,5,5,26,26,26,6,25,15,15,8,8,8,18,99,99,99,99,99,99,99,99,99,99,99},{0,25,6,19,6,19,25,12,12,11,20,7,20,24,12,99,99,99,99,99,99,99,99,99,99,99}},

{{7,6,26,5,26,8,25,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,12,19,19,18,15,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{3,26,6,6,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,16,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,5,5,26,25,6,6,25,15,17,14,8,8,19,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,13,7,24,23,19,13,12,15,17,12,8,12,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,26,5,5,26,24,21,8,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,15,9,22,13,23,13,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{16,7,7,23,7,24,24,12,7,24,24,17,10,11,18,15,13,99,99,99,99,99,99,99,99,99},{0,6,25,16,20,6,22,10,11,9,26,16,24,20,7,21,25,99,99,99,99,99,99,99,99,99}},{{14,25,26,5,5,5,26,18,5,8,8,8,10,13,21,99,99,99,99,99,99,99,99,99,99},{0,12,23,6,20,25,6,21,10,24,7,21,10,11,22,99,99,99,99,99,99,99,99,99,99,99}},{{13,24,7,24,7,24,8,9,19,12,19,12,13,18,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,13,18,18,21,10,21,8,23,22,9,20,11,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{12,25,5,26,16,24,7,19,8,15,9,17,6,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,8,8,13,13,13,13,9,21,20,17,22,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,26,22,21,13,6,7,9,18,18,6,10,29,12,99,99,99,99,99,99,99,99,99,99,99,99},{0,24,18,12,18,8,18,7,9,17,11,19,24,9,99,99,99,99,99,99,99,99,99,99,99}},{{14,5,26,26,7,25,16,16,17,7,8,10,13,13,27,99,99,99,99,99,99,99,99,99,99},{0,7,7,24,12,13,16,12,19,17,8,22,21,18,21,99,99,99,99,99,99,99,99,99,99}},{{12,10,6,21,10,19,24,24,23,14,18,26,24,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,21,10,12,19,10,13,19,11,22,17,22,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,26,12,24,7,7,24,7,25,6,11,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,7,18,14,18,14,22,21,8,24,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,5,5,6,6,8,8,24,24,22,9,20,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,25,7,12,21,24,19,14,9,7,20,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,26,5,5,6,6,8,21,8,16,19,22,9,12,17,99,99,99,99,99,99,99,99,99,99},{0,15,20,25,7,12,21,16,24,20,19,19,10,11,12,99,99,99,99,99,99,99,99,99,99}},

{{17,23,23,8,20,20,8,9,15,9,11,8,16,18,15,19,21,12,99,99,99,99,99,99,99},{0,11,20,25,11,20,6,14,16,17,24,9,11,16,23,23,14,19,99,99,99,99,99,99,99}},{{14,5,26,26,5,5,25,6,25,12,8,8,18,15,8,99,99,99,99,99,99,99,99,99,99},{0,14,18,25,7,19,12,24,7,16,13,20,15,18,8,99,99,99,99,99,99,99,99,99,99}},{{13,26,25,5,5,5,6,8,15,25,8,17,18,8,99,99,99,99,99,99,99,99,99,99,99},{0,12,20,20,7,13,24,12,16,15,21,19,15,8,99,99,99,99,99,99,99,99,99,99,99}},{{9,10,7,24,6,25,21,5,25,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,18,13,22,9,23,10,22,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{12,6,24,19,17,12,23,20,25,27,26,26,20,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,21,12,17,15,9,18,24,19,11,7,21,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,26,6,7,25,15,15,24,15,18,10,10,25,27,99,99,99,99,99,99,99,99,99,99,99},{0,9,10,13,13,13,20,19,17,20,19,22,22,17,99,99,99,99,99,99,99,99,99,99,99}},{{12,11,6,22,25,25,21,7,25,13,8,13,18,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,24,24,17,14,8,14,21,8,18,11,11,99,99,99,99,99,99,99,99,99,99,99,99}},

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{{11,26,17,6,26,26,17,7,8,14,8,13,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,13,9,9,22,18,12,18,18,21,21,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,21,26,7,10,7,10,21,24,20,26,25,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,9,20,11,13,20,22,20,19,12,17,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,6,26,7,7,10,26,6,7,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,14,17,14,24,18,22,10,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,6,7,25,8,24,18,21,21,25,7,6,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,23,13,7,10,22,11,21,19,26,13,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,7,6,24,19,8,17,6,10,13,12,17,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,8,16,16,11,19,25,21,20,10,12,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,9,22,22,8,9,8,14,8,11,17,15,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,24,11,20,6,16,9,16,27,7,15,7,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,25,19,26,26,26,6,14,7,6,8,7,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,25,15,8,11,20,8,16,11,23,20,14,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{10,14,26,6,26,7,7,8,18,7,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,14,23,18,8,11,20,15,14,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,26,7,6,26,6,24,11,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,19,9,9,22,12,9,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{13,7,17,26,17,24,26,26,20,10,20,13,27,13,99,99,99,99,99,99,99,99,99,99,99},{0,16,17,7,12,20,11,25,11,14,18,15,18,19,99,99,99,99,99,99,99,99,99,99,99}},{{12,7,24,15,14,7,24,7,7,25,23,18,18,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,14,14,20,10,10,22,19,19,23,23,20,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,7,11,25,15,8,8,11,21,6,25,19,12,18,18,99,99,99,99,99,99,99,99,99,99},{0,23,23,14,7,10,19,8,23,13,20,9,12,6,12,99,99,99,99,99,99,99,99,99,99}},{{10,7,24,24,7,6,21,25,9,13,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,8,12,9,18

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18,12,15,18,99,99,99,99,99,99,99,99,99,99},{0,22,23,20,23,22,13,7,7,12,19,10,26,11,7,11,99,99,9
9,99,99,99,99,99,99}},{{16,15,15,7,7,24,24,7,7,24,24,6,25,25,7,18,18,99,99,99,99,99,99,99,99},
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9,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,14,10,10,13,23,16,99,99,99,99,99,99,99,99,99
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99,99,99,99,99,99,99,99,99,99},{0,22,11,7,25,21,12,17,11,14,7,20,99,99,99,99,99,99,99,99,99,
99,99,99,99}},{{12,26,20,7,7,7,6,19,14,10,11,17,7,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,1
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99,99}}},

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{{18,6,6,6,24,24,6,15,15,9,9,25,25,26,26,9,9,18,18,99,99,99,99,99,99},{0,20,24,7,9,22,11,21,10,21,10,25,12,6,19,6,25,11,20,99,99,99,99,99,99}},{{4,26,7,25,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,16,14,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{5,25,5,21,26,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,18,18,15,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,14,26,18,7,25,25,6,25,7,14,26,6,9,26,99,99,99,99,99,99,99,99,99,99},{0,11,19,11,9,8,11,19,22,12,14,25,24,18,14,99,99,99,99,99,99,99,99,99,99}},{{6,7,25,7,25,25,7,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,14,10,10,22,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{15,23,13,7,7,23,23,18,13,10,24,24,7,25,16,17,99,99,99,99,99,99,99,99,99},{0,14,10,24,7,23,7,15,21,23,10,26,10,20,10,20,99,99,99,99,99,99,99,99,99}},{{8,12,24,25,8,8,19,26,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,23,10,8,23,21,6,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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{{10,8,21,24,7,11,7,12,19,24,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,23,14,18,22,14,9,9,18,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,6,25,8,13,18,8,24,7,24,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,8,11,23,23,21,11,17,17,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,11,23,7,24,8,17,17,14,20,13,8,24,26,99,99,99,99,99,99,99,99,99,99,99},{0,22,22,9,9,21,18,12,12,23,18,12,12,23,99,99,99,99,99,99,99,99,99,99,99}},{{11,7,25,18,8,17,14,24,13,8,23,11,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,8,18,22,12,12,16,18,11,11,23,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,17,9,17,20,23,7,22,9,25,7,24,12,20,99,99,99,99,99,99,99,99,99,99,99},{0,23,22,17,21,21,18,10,10,18,14,14,9,24,99,99,99,99,99,99,99,99,99,99,99}},{{15,7,25,6,6,6,25,25,14,17,24,14,17,9,9,9,99,99,99,99,99,99,99,99,99},{0,18,18,9,13,23,8,13,12,12,23,20,20,21,12,8,99,99,99,99,99,99,99,99,99}},{{8,7,25,6,24,23,8,8,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,10,21,21,17,14,17,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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1,12,12,16,21,9,9,99,99,99,99,99,99},{0,12,7,24,10,21,16,21,15,10,11,20,10,8,23,16,13,6,25,99
,99,99,99,99,99}},

{{14,6,6,25,25,24,24,7,7,14,17,9,9,12,15,99,99,99,99,99,99,99,99,99,99},{0,12,19,19,12,23,8,8,
23,16,15,12,20,19,19,99,99,99,99,99,99,99,99,99,99}},{{15,25,24,6,6,6,7,23,23,14,9,9,9,12,17,1
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99,99,99,99}},{{12,12,6,6,25,25,9,9,18,19,12,9,16,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,1
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{{11,6,14,25,6,14,17,9,26,23,15,17,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,21,21,10,12,
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99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,11,21,9,12,12,12,99,99,99,99,99,99,99,99,99,99
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99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,11,20,12,12,10,14,23,99,99,99,99,99,99,9
9,99,99,99,99,99,99,99,99,99}},

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9,99,99,99,99,99},{0,10,12,10,12,12,18,18,21,16,20,20,99,99,99,99,99,99,99,99,99,99,99,99,99
}},{{15,17,26,19,21,20,7,23,14,11,17,23,22,7,8,15,99,99,99,99,99,99,99,99,99},{0,15,24,19,22,1
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20,20,22,20,23,13,15,17,16,15,99,99,99,99,99,99,99,99}},{{6,6,7,26,8,8,13,99,99,99,99,99,99,9

9,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,24,15,13,17,15,99,99,99,99,99,99,99,99,99,99,99,99,
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},{0,9,23,18,9,13,20,23,22,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,6,6,20,26,25
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99,99,99,99,99,99,99,99,99}},

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9,99,99,99,99}},{{12,8,6,21,25,26,13,19,14,19,22,8,11,99,99,99,99,99,99,99,99,99,99,99,99},{0,
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99,99,99,99,99,99,99,99,99,99,99}},

{{11,15,18,26,7,8,10,22,12,18,16,8,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,12,9,15,20,14,10,22,15,18,23,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,22,19,5,26,12,8,24,17,15,7,7,13,13,10,99,99,99,99,99,99,99,99,99,99},{0,14,16,19,18,21,19,11,11,20,14,22,10,13,14,99,99,99,99,99,99,99,99,99,99}},{{11,25,18,6,21,14,7,25,8,11,8,14,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,14,15,12,15,18,20,21,23,24,20,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,24,8,11,15,24,8,15,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,21,20,9,9,24,12,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,25,8,7,8,12,7,15,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,16,21,13,14,9,13,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,6,6,24,12,15,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,23,14,11,21,10,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,6,22,25,6,9,13,22,9,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,11,11,11,10,11,14,20,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

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{{10,23,25,6,8,21,10,6,25,12,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,7,7,10,20,20,19,19,23,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,6,15,24,14,23,25,6,8,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,21,23,11,11,8,8,11,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,25,6,15,14,6,8,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,22,20,12,9,12,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{16,17,10,16,23,19,5,11,20,11,8,23,20,24,7,25,14,99,99,99,99,99,99,99,99},{0,17,23,24,24,22,16,7,7,10,13,13,10,9,9,20,8,99,99,99,99,99,99,99,99}},{{8,6,6,25,25,13,16,16,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,22,9,22,11,11,20,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{2,6,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,15,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,6,20,23,23,23,26,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,11,18,14,11,14,21,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{9,6,25,25,13,16,14,6,6,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,9,22,11,13,16,21,24,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{3,6,24,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,21,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{15,25,25,21,6,25,6,6,6,24,14,14,11,10,17,17,99,99,99,99,99,99,99,99,99,

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99,99,99,99,99,99,99,99}},

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,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,15,16,18,99,99,99,99,99,99,99,
99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{5,13,10,26,5,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,14,15,16,16
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{{{10,19,24,5,4,20,27,7,20,8,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,9,12,15,19,23,17,14,14,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,7,16,13,14,10,26,18,5,23,26,26,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,12,12,17,18,16,21,16,21,13,19,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,7,5,18,26,9,26,9,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,14,8,22,9,15,12,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,25,6,7,21,7,12,24,27,8,9,24,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,10,13,20,17,22,16,10,20,10,19,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,19,7,11,5,6,25,18,19,24,22,14,27,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,11,12,19,14,14,24,21,19,11,12,18,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,20,5,7,6,19,26,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,10,13,18,20,13,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,15,15,26,23,6,8,18,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,16,21,15,19,11,22,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{8,19,19,24,21,5,9,26,27,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,12,19,10,22,20,

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,16,8,25,6,25,22,13,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,9,12,20,24,8,9,8,15,1
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2,26,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,8,24,7,25,12,9,23,15,18,99,99,99,99,
99,99,99,99,99,99,99,99,99,99}},

{{9,6,23,26,5,14,19,9,8,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,18,19,9,21,20,2
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,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,12,9,5,20,25,12,7,23,24,15,99,99,99,99,99,99,99,99
,99,99,99,99,99}},{{6,6,12,19,25,8,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{
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,99}}},{{{9,25,15,16,18,6,25,10,19,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,20,1
6,19,21,9,20,14,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,6,14,14,23,8,17,7,17,2
1,26,23,24,17,9,99,99,99,99,99,99,99,99,99,99},{0,15,14,20,9,19,19,22,13,19,13,12,19,22,16,9
9,99,99,99,99,99,99,99,99,99}},

{{12,8,23,12,5,22,14,7,26,24,11,15,18,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,13,20,19,19,
13,22,13,16,14,10,13,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,6,23,6,26,6,15,16,24,9,23,10,
10,12,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,10,16,9,19,12,22,14,19,17,12,15,20,99,99,99,99
,99,99,99,99,99,99,99}},{{12,6,14,14,22,18,22,7,25,6,9,17,22,99,99,99,99,99,99,99,99,99,99,99,99,
99},{0,23,20,13,20,10,10,13,9,17,19,18,15,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,25,6,7,1
4,10,17,8,15,15,24,19,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,24,11,14,12,12,16,20,17,1

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{{8,6,26,5,8,26,14,18,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,17,10,21,20,13,18,15,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,6,6,26,25,19,15,22,11,9,22,18,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,24,19,7,11,14,11,17,21,15,15,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,24,23,26,12,15,18,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,20,13,13,16,12,11,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{17,8,6,23,19,25,9,16,12,17,25,22,22,14,19,19,8,11,99,99,99,99,99,99,99},{0,15,25,13,15,6,26,12,24,23,22,23,16,17,11,20,18,17,99,99,99,99,99,99,99}},{{12,8,25,21,6,25,13,19,12,20,16,9,15,99,99,99,99,99,99,99,99,99,99,99,99},{0,15,18,18,24,7,14,10,22,21,13,25,19,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,8,24,25,20,8,18,14,14,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,12,15,10,22,19,10,19,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,6,19,16,24,8,9,17,6,8,11,11,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,12,14,9,17,20,18,20,23,12,15,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{11,19,22,7,26,24,19,9,13,13,16,10,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,14,20,18,11,17,14,19,22,21,19,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,6,25,18,14,21,9,26,8,5,12,9,14,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,8,14,14,12,21,20,17,17,20,24,17,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,6,23,9,12,23,16,11,26,10,23,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,15,20,20,9,11,13,11,23,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,25,9,8,7,9,16,19,19,22,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,14,10,21,17,11,10,13,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,6,23,6,26,18,21,17,13,13,9,10,16,99,99,99,99,99,99,99,99,99,99,99,99},{0,14,11,22,11,9,16,18,19,22,24,19,12,99,99,99,99,99,99,99,99,99,99,99,99}},{{7,6,6,25,19,9,15,11,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,11,11,12,20,17,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{18,7,7,24,21,25,7,19,18,21,22,14,24,10,21,11,15,12,13,99,99,99,99,99,99},{0,8,24,15,16,6,17,8,13,12,9,15,18,16,19,25,20,10,5,99,99,99,99,99,99}},

{{7,26,25,20,7,13,6,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,21,14,24,16,14,17,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,6,25,13,7,16,13,20,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,10,10,13,22,13,16,10,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,7,24,8,24,25,7,11,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,19,21,11,8,24,21,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}},{{{10,25,15,17,6,19,26,9,9,11,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,16,19,21,14,9,20,23,17,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,8,14,15,22,19,25,18,10,26,10,16,25,7,22,99,99,99,99,99,99,99,99,99,99},{0,20,20,13,10,22,17,13,15,14,23,16,11,23,20,99,99,99,99,99,99,99,99,99,99}},{{9,12,8,25,24,22,18,11,11,28,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,19,20,13,16,19,11,22,14,13,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{12,6,6,13,25,25

,9,11,14,17,20,16,21,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,16,23,8,11,22,13,12,11,10,22,
20,99,99,99,99,99,99,99,99,99,99,99,99,99}},

{{12,14,22,15,6,19,23,7,25,26,16,9,23,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,21,13,23,10,
11,18,18,11,16,15,14,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,7,13,7,10,18,23,16,15,26,9,99
,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,11,13,23,12,10,8,13,20,8,17,99,99,99,99,99,99,99,
99,99,99,99,99,99,99}},{{7,7,16,24,16,10,25,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,9
9,99},{0,21,20,12,10,12,15,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{13,16,17,
6,7,23,9,15,25,26,10,19,22,14,99,99,99,99,99,99,99,99,99,99,99},{0,20,11,14,24,8,13,14,18,8,2
2,19,18,23,99,99,99,99,99,99,99,99,99,99,99}},{{10,8,24,22,6,8,7,25,14,17,25,99,99,99,99,99,9
9,99,99,99,99,99,99,99,99,99},{0,13,18,14,23,19,16,10,16,15,13,99,99,99,99,99,99,99,99,99,99,99
,99,99,99}},{{7,5,8,26,13,17,20,25,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,21,1
9,11,18,17,16,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{10,6,6,20,16,25,26,12
,22,20,9,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,24,15,11,13,18,7,13,8,14,21,99,99,99,9
9,99,99,99,99,99,99,99,99,99,99}},

{{6,6,24,23,13,26,18,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,18,20,12,14,15
,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{14,25,7,7,23,24,15,19,10,18,19,
19,16,12,13,99,99,99,99,99,99,99,99,99,99},{0,22,16,25,14,6,13,15,25,23,11,18,10,17,27,99,99
,99,99,99,99,99,99,99,99}},{{12,8,6,21,25,26,13,19,14,19,22,8,11,99,99,99,99,99,99,99,99,99,9
9,99,99},{0,15,24,18,18,8,14,21,22,10,21,21,25,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,8,24,
25,15,17,27,8,17,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,20,11,15,12,20,12,23,8,
12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{11,15,18,26,7,8,10,22,12,18,16,8,99,99,99
,99,99,99,99,99,99,99,99,99,99},{0,13,12,9,15,20,14,10,22,15,18,23,99,99,99,99,99,99,99,99,9
9,99,99,99,99}},{{14,22,19,5,26,12,8,24,17,15,7,7,13,13,10,99,99,99,99,99,99,99,99,99,99},{0,1
4,16,19,18,21,19,11,11,20,14,22,10,13,14,99,99,99,99,99,99,99,99,99,99}},{{11,25,18,6,21,14,7
,25,8,11,8,14,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,14,15,12,15,18,20,21,23,24,20,99,9
9,99,99,99,99,99,99,99,99,99,99,99}},

{{8,24,8,11,15,24,8,15,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,16,21,20,9,9,24,1
2,16,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{8,25,8,7,8,12,7,15,19,99,99,99,99,99,
99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,9,16,21,13,14,9,13,11,99,99,99,99,99,99,99,99,99,99,
99,99,99,99,99}},{{6,6,6,24,12,15,19,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{
0,23,14,11,21,10,10,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{9,6,22,25,6,9,1
3,22,9,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,22,11,11,11,10,11,14,20,19,99,99,
99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{15,6,7,25,22,25,6,15,20,11,9,19,12,14,13,14,99,99,
99,99,99,99,99,99,99,99},{0,26,18,6,16,15,9,15,8,8,25,13,25,21,18,5,99,99,99,99,99,99,99,99,99}},
{{9,26,14,25,20,7,17,6,9,12,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,7,16,20,15,14,17,
24,23,20,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}},{{6,13,7,17,25,6,20,99,99,99,99,99,99
,99,99,99,99,99,99,99,99,99,99,99,99},{0,13,22,12,10,10,11,99,99,99,99,99,99,99,99,99,99,99,99,
99,99,99,99,99,99,99}},

{{9,25,8,7,24,25,26,11,19,8,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99},{0,8,23,14,11,19,14,
22,14,26,99,99,99,99,99,99,99,99,99,99,99,99,99,99,99}}}};

```
	int train_num = 45;
	double score[train_num][3][26]; // score[num_database][three different stastics][26 letter];

	for(l=0; l < train_num; l++){
		for(k=0; k < 26; k++) {

			////compare data
			//first step: compare both data length
			int data_length = (train_data[l][k][0][0] > test_data[0][0]) ? test_data[0][0] :
train_data[l][k][0][0];
			//printf("length: %d \n", data_length);
			//second: rearrange array order based on the distance
			int order[21]; // the val at index i is already been shifted, i.e the
			int check[100];

			for (i = 0; i < 100; i++) {
				check[i] = 0;
			}
			for (i = 0; i < data_length; i++) {
				float min_dist = 42;
				int best_fit = 22;
				for (j = 0; j < test_data[0][0]; j++) {
					float dist = dist_fn(test_data[0][j+1], train_data[l][k][0][i+1],
test_data[1][j+1], train_data[l][k][1][i+1]);
					//printf("the dist of train data%d --> test data%d: %f\n",i, j,
dist);
					if (check[j] == 0) {
						if (dist < min_dist) {
							min_dist = dist;
							best_fit = j;
							//printf("update min_dist for %d --> %d, now
is %f\n",i, j, min_dist);
						}
					}
				}
				check[best_fit] = 1;
				order[i] = best_fit + 1;
				//printf("%d\n", order[i]);
			}

			//Third do the normal pdf and Kull
			//1. sum(normalpdf(x) .* pdf(y)
```

```
                        double Pdf_dot = 0.0;
                        for (i = 0; i < data_length; i++){
                                Pdf_dot = Pdf_dot +  normpdf(test_data[0][order[i]],
train_data[l][k][0][i+1]) * normpdf(test_data[1][order[i]], train_data[l][k][1][i+1]);
                        }
                        //2. normalpdf: sum(x) * sum(y)
                        score[l][0][k] = Pdf_dot;
                        double P_x = 0.0;
                        double P_y = 0.0;
                        for (i = 0; i < data_length; i++){
                                P_x = P_x +  normpdf(test_data[0][order[i]], train_data[l][k][0][i+1]);
                                P_y = P_y +  normpdf(test_data[1][order[i]], train_data[l][k][1][i+1]);
                        }
                        score[l][1][k] = P_x * P_y;
                        //3. Kull(x) * Kull (y)
                        double K_x =0.0;
                        double K_y = 0.0;
                        for (i = 0; i < data_length; i++){
                                K_x = K_x +  Kull(test_data[0][order[i]], train_data[l][k][0][i+1]);
                                K_y = K_y +  Kull(test_data[1][order[i]], train_data[l][k][1][i+1]);
                                //printf("Kx: %d, Ky: %d Kx: %d, Ky: %d\n", test_data[0][order[i]],
test_data[1][order[i]], train_data[l][k][0][i+1], train_data[l][k][1][i+1]);
                        }
                        if(K_x * K_y < 0){
                                score[l][2][k] = -1.0 *K_x * K_y;
                        }
                        else{
                                score[l][2][k] = K_x * K_y;
                        }
                        //printf("idx:%d,  %d  %d Pdf1: %f, Pdf2: %f K: %f \n",  l, k, data_length,
score[l][0][k],  score[l][1][k],score[l][2][k]);
                        //third compare result
                }
                //printf("next: \n");
        }//end compare to train database

        double list[3][26] =
{{0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0},{0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0},{0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0}};
        double max = 0;
        int max_index = 0;
        double min = 999;
        int min_index = 0;
        //start compare
```

```
	for(l = 0; l < train_num; l ++){
	//score1
		max = 0;
		max_index = 0;

		maximum(score[l][0], &max, &max_index, 26);
		list[0][max_index] = list[0][max_index] + 1.0;
		//printf("idx: %d \n", max_index);
		//score2
		max = 0;
		max_index = 0;
		maximum(score[l][1], &max, &max_index, 26);
		list[1][max_index] = list[1][max_index] + 1.0;
		//score3
		min = 999;
		min_index = 0;
		minimum(score[l][2], &min, &min_index, 26);
		list[2][min_index] = list[2][min_index] + 1.0;
	}
	/*for(j = 0; j < 3; j++){
	for(i=0; i<26; i++){
		printf("%f ", list[j][i]);
	}
	printf("\n");
	}*/

	//find the correspond letter
	char Text_arr[26]
={'A','B','C','D','E','F','G','H','I','J','K','L','M','N','O','P','Q','R','S','T','U','V','W','X','Y','Z'};
	int text_idx1,text_idx2,text_idx3;
	double val1,val2,val3;

	for(l = 0; l < 3; l++){
		max = 0;
		max_index = 0;
		maximum(list[l], &max, &max_index, 26);

		if(l == 0){
			text_idx1 = max_index;
			val1 = max;
		}
		else if(l == 1){
			text_idx2 = max_index;
```

```
                        val2 = max;
                }
                else{
                        text_idx3 = max_index;
                        val3 = max;
                }
        }
        printf("first:%d, %f second:%d, %f third:%d, %f\n",
text_idx1,val1,text_idx2,val2,text_idx3,val3);
        double tmp_val[3]={val1,val2,val3};
        int tmp_idx[3]={text_idx1,text_idx2,text_idx3};
        int tmp_buff[3] ={3,3,3};
        int tmp_count = 0;
        char final_ans;
        //determine the text
        if(text_idx1 == text_idx2 || text_idx1 == text_idx3){
                final_ans = Text_arr[text_idx1];
        }
        else if(text_idx2 == text_idx3){
                final_ans = Text_arr[text_idx2];
        }
        else{
                max = 0;
                max_index = 0;
                maximum(tmp_val, &max, &max_index, 3);
                for(i = 0; i < 3; i++){     //check if there is two factors have same weight
                        if(tmp_val[i] == max){
                                tmp_buff[i] = i;
                                tmp_count = tmp_count + 1;
                        }
                }
                if(tmp_count == 2){
                        if(tmp_buff[0] == 0 && tmp_buff[1] == 2){
                                final_ans = Text_arr[text_idx1];
                        }
                        else{
                                final_ans = Text_arr[text_idx2];
                        }
                }
                else{
                        final_ans = Text_arr[tmp_idx[max_index]];
                }
        }
```

```
	for(i=0;i <26; i++){
		if(Text_arr[i] == user_char){
			user_input = i;
		}
	}
	char InputInfo[40] ="The input image is  .\0";
	char Outputmsg[40] ="The letter should be  .\0";
	InputInfo[19] = Text_arr[user_input];
	Outputmsg[21] = final_ans;



	VGA_box(50, 420, 250, 470, 0x22); //finish text image

	int finish_msg[336] =
{0,1,1,1,1,1,0,0,1,1,1,1,1,0,0,1,0,0,0,1,0,0,1,1,1,1,1,0,0,0,1,1,1,0,0,0,1,0,0,0,1,0,0,1,0,0,0,0,0,0,
0,0,1,0,0,0,0,1,1,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,1,0,0,0,0,0,0,0,1,0,0,0,0,1,1,
0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,1,0,0,0,1,0,0,1,0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,1,0,1,0,0,0,0,1,0,
0,0,0,0,1,1,1,0,0,0,1,1,1,1,1,0,0,1,1,1,0,0,0,0,0,0,1,0,0,0,0,1,0,1,0,1,0,0,0,0,1,0,0,0,0,0,0,0,0,1,0,
0,1,0,0,0,1,0,0,1,0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,0,1,1,0,0,0,0,1,0,0,0,0,0,0,0,1,0,0,1,0,0,0,1,0,0,1,
0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,0,1,1,0,0,0,0,1,0,0,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,1,0,0,0,0,0,0,1,1,1,
1,1,0,0,1,0,0,0,1,0,0,1,1,1,1,1,1,0,0,0,1,1,1,0,0,0,1,0,0,0,1,0};
	for (j=2; j < 338; j++){
		if(finish_msg[j-2] == 1){
				VGA_box(3*((j-2)%42-1) + 90, 3*((j-2)/42-1)+435, 3*((j-2)%42-1) +
93, 3*((j-2)/42-1)+438, 0xff);
		}
	}
	short text_color;
	if(Text_arr[user_input] == final_ans){
		text_color = 0x28;
		VGA_box(400, 420, 600, 470, text_color);
		int bingo_msg[280]
={0,1,1,1,1,0,0,0,1,1,1,1,1,0,0,1,0,0,0,1,0,0,1,1,1,1,1,0,0,1,1,1,1,1,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0
,1,1,0,0,1,0,0,1,0,0,0,0,0,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0,1,1,0,0,1,0,0,1,0,0,0,0,0,0,1,0
,0,0,1,0,0,1,1,1,1,0,0,0,0,0,1,0,0,0,0,1,0,1,0,1,0,0,1,0,0,0,0,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,0,0,1,0
,0,0,0,1,0,1,0,1,0,0,1,0,1,1,1,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,1,1,0,0,1,0,0,0,1,0
,0,1,0,0,0,1,0,0,1,0,0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,0,1,1,0,0,1,0,0,0,1,0,0,1,0,0,0,1,0,0,1,1,1,1,0,0,0,1
,1,1,1,1,0,0,1,0,0,0,1,0,0,1,1,1,1,1,0,0,1,1,1,1,1,0};
		int smile[225] =
{2,2,2,2,2,1,1,1,1,1,2,2,2,2,2,2,2,2,1,1,0,0,0,0,0,1,1,2,2,2,2,2,1,0,0,0,0,0,0,0,0,0,1,2,2,2,1,0,0,0,
0,0,0,0,0,0,0,0,1,2,2,1,0,0,0,0,0,0,0,0,0,0,0,1,2,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,0,1,2,2,1,1,1,1,2,2,
1,1,0,1,1,0,1,2,1,1,1,0,1,2,1,1,1,0,1,1,0,0,1,1,1,0,0,0,1,1,1,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,1,2,1,
```

```
0,0,0,0,0,0,0,0,1,0,0,1,2,2,1,0,0,0,1,1,1,1,1,0,0,0,1,2,2,2,1,0,0,0,0,0,0,0,0,0,1,2,2,2,2,2,1,1,0,0,0,
0,0,1,1,2,2,2,2,2,2,2,2,1,1,1,1,1,1,2,2,2,2,2};
                short smile_color;
                for (i=2; i < 282; i++){
                        if(bingo_msg[i-2] == 1){
                                VGA_box(3*((i-2)%35-1) + 450, 3*((i-2)/35-1)+435, 3*((i-2)%35-1)
+ 453, 3*((i-2)/35-1)+438, 0xff);
                }
                }

                for (i=2; i < 227; i++){
                        if(smile[i-2] == 1){
                                smile_color = 0x00;
                }
                else if(smile[i-2] == 2){
                        smile_color = 0x9f;
                }
                else{
                        smile_color = 0xa4;
                }
                VGA_box(3*((i-2)%15-1) + 315, 3*((i-2)/15-1)+423, 3*((i-2)%15-1) + 318,
3*((i-2)/15-1)+426, smile_color);
                }




        }
        else{
                text_color = 0x60;
                VGA_box(400, 420, 600, 470, text_color);

                int fail_msg[224] =
{0,1,1,1,1,1,0,0,0,1,1,1,0,0,0,1,1,1,1,1,0,0,1,0,0,0,0,0,0,1,0,0,0,0,0,0,1,0,0,0,0,0,0,1,0,0,0,0,0,0,
1,0,0,0,0,0,0,1,0,0,0,0,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,1,0,0,0,0,0,0,1,0,0,0,1,0,0,0,0,
1,0,0,0,0,1,0,0,0,0,0,0,1,1,1,0,0,0,0,1,1,1,1,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,1,0,0,0,0,0,0,1,0,0,0,
1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,0,1,0,0,0,0,0,0,1,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,1,0,0,0,0,
0,1,0,0,0,1,0,0,1,1,1,1,1,1,0,0,1,1,1,1,1,1,0};
                int sad[225] =
{2,2,2,2,2,1,1,1,1,1,2,2,2,2,2,2,2,2,1,1,0,0,0,0,0,1,1,2,2,2,2,2,1,0,0,0,0,0,0,0,0,0,1,2,2,2,1,0,1,1,
1,0,0,0,1,1,1,0,1,2,2,1,0,0,0,0,0,0,0,0,0,0,0,1,2,1,0,0,1,0,1,0,0,0,1,0,1,0,0,1,1,0,0,0,1,0,0,0,0,0,1,
0,0,0,1,1,0,0,1,0,1,0,0,0,1,0,1,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,1,2,1,
0,0,0,0,1,1,1,0,0,0,0,0,1,2,2,1,0,0,0,1,0,0,0,1,0,0,0,1,2,2,2,1,0,0,0,0,0,0,0,0,0,1,2,2,2,2,2,1,1,0,0,0,
0,0,1,1,2,2,2,2,2,2,2,2,1,1,1,1,1,1,2,2,2,2,2};
```

```
                short sad_color;
                for (i=2; i < 226; i++){
                        if(fail_msg[i-2] == 1){
                                VGA_box(3*((i-2)%28-1) + 470, 3*((i-2)/28-1)+435, 3*((i-2)%28-1)
+ 473, 3*((i-2)/28-1)+438, 0xff);
                }
                }
                for (i=2; i < 227; i++){
                        if(sad[i-2] == 1){
                                sad_color = 0x00;
                }
                else if(sad[i-2] == 2){
                        sad_color = 0x9f;
                }
                else{
                        sad_color = 0xc4;
                }
                VGA_box(3*((i-2)%15-1) + 315, 3*((i-2)/15-1)+423, 3*((i-2)%15-1) + 318,
3*((i-2)/15-1)+426, sad_color);
                }
        }
        //VGA_text(70,50, "HELLO");

        printf("The letter should be  %c. \n", Outputmsg[21]);




} // end main

//normal distribution
double normpdf(int x, int mu){

        float sigma = 2.0;
        double y = (1.0 / (sigma * sqrt(2*M_PI))) * exp(-(x - mu)*(x - mu) / (2.0 * sigma * sigma));
        return y;
}

//Kullback-Leibler
double Kull(int x, int y){
        int array_size = 30;
        double ans = (1.0 * x / array_size) * log( x * 1.0 / y );
        return ans;
}
```

```
//distance function
double dist_fn(int test_x, int train_x, int test_y, int train_y){
	double ans = sqrt(pow((test_x - train_x),2) + pow((test_y - train_y),2));
	return ans;
}



/*******************************************************************************************
 * Subroutine to read a pixel from the video input
*******************************************************************************************/
// int  video_in_read_pixel(int x, int y){
	// char  *pixel_ptr ;
	// pixel_ptr = (char *)video_in_ptr + ((y)<<9) + (x) ;
	// return *pixel_ptr ;
// }

/*******************************************************************************************
 * Subroutine to read a pixel from the VGA monitor
*******************************************************************************************/
int  VGA_read_pixel(int x, int y){
	char  *pixel_ptr ;
	pixel_ptr = (char *)vga_pixel_ptr + ((y)*640) + (x) ;
	return *pixel_ptr ;
}

/*******************************************************************************************
 * Subroutine to send a string of text to the VGA monitor
*******************************************************************************************/
void VGA_text(int x, int y, char * text_ptr)
{
	volatile char * character_buffer = (char *) vga_char_ptr ;	// VGA character buffer
	int offset;
	/* assume that the text string fits on one line */
	offset = (y << 7) + x;
	while ( *(text_ptr) )
	{
		// write to the character buffer
		*(character_buffer + offset) = *(text_ptr);
		++text_ptr;
		++offset;
	}
```

```
}

/*****************************************************************************
 * Subroutine to clear text to the VGA monitor
*****************************************************************************/
void VGA_text_clear()
{
	volatile char * character_buffer = (char *) vga_char_ptr ;	// VGA character buffer
	int offset, x, y;
	for (x=0; x<79; x++){
		for (y=0; y<59; y++){
	/* assume that the text string fits on one line */
			offset = (y << 7) + x;
			// write to the character buffer
			*(character_buffer + offset) = ' ';
		}
	}
}

/*****************************************************************************
 * Draw a filled rectangle on the VGA monitor
*****************************************************************************/
#define SWAP(X,Y) do{int temp=X; X=Y; Y=temp;}while(0)

void VGA_box(int x1, int y1, int x2, int y2, short pixel_color)
{
	char  *pixel_ptr ;
	int row, col;

	/* check and fix box coordinates to be valid */
	if (x1>639) x1 = 639;
	if (y1>479) y1 = 479;
	if (x2>639) x2 = 639;
	if (y2>479) y2 = 479;
	if (x1<0) x1 = 0;
	if (y1<0) y1 = 0;
	if (x2<0) x2 = 0;
	if (y2<0) y2 = 0;
	if (x1>x2) SWAP(x1,x2);
	if (y1>y2) SWAP(y1,y2);
	for (row = y1; row <= y2; row++)
		for (col = x1; col <= x2; ++col)
		{
			//640x480
```

```
                        VGA_PIXEL(col, row, pixel_color);
                        //pixel_ptr = (char *)vga_pixel_ptr + (row<<10)    + col ;
                        // set pixel color
                        //*(char *)pixel_ptr = pixel_color;
                }
}

/****************************************************************************************
 * Draw a filled circle on the VGA monitor
****************************************************************************************/

void VGA_disc(int x, int y, int r, short pixel_color)
{
        char  *pixel_ptr ;
        int row, col, rsqr, xc, yc;

        rsqr = r*r;

        for (yc = -r; yc <= r; yc++)
                for (xc = -r; xc <= r; xc++)
                {
                        col = xc;
                        row = yc;
                        // add the r to make the edge smoother
                        if(col*col+row*row <= rsqr+r){
                                col += x; // add the center point
                                row += y; // add the center point
                                //check for valid 640x480
                                if (col>639) col = 639;
                                if (row>479) row = 479;
                                if (col<0) col = 0;
                                if (row<0) row = 0;
                                VGA_PIXEL(col, row, pixel_color);
                                //pixel_ptr = (char *)vga_pixel_ptr + (row<<10) + col ;
                                // set pixel color
                                //nanosleep(&delay_time, NULL);
                                //draw_delay();
                                //*(char *)pixel_ptr = pixel_color;
                        }

                }
}

// ========================================
```

```
// === Draw a line
// ================================================
//plot a line
//at x1,y1 to x2,y2 with color
//Code is from David Rodgers,
//"Procedural Elements of Computer Graphics",1985
void VGA_line(int x1, int y1, int x2, int y2, short c) {
        int e;
        signed int dx,dy,j, temp;
        signed int s1,s2, xchange;
    signed int x,y;
        char *pixel_ptr ;

        /* check and fix line coordinates to be valid */
        if (x1>639) x1 = 639;
        if (y1>479) y1 = 479;
        if (x2>639) x2 = 639;
        if (y2>479) y2 = 479;
        if (x1<0) x1 = 0;
        if (y1<0) y1 = 0;
        if (x2<0) x2 = 0;
        if (y2<0) y2 = 0;

        x = x1;
        y = y1;

        //take absolute value
        if (x2 < x1) {
                dx = x1 - x2;
                s1 = -1;
        }

        else if (x2 == x1) {
                dx = 0;
                s1 = 0;
        }

        else {
                dx = x2 - x1;
                s1 = 1;
        }

        if (y2 < y1) {
                dy = y1 - y2;
```

```
		s2 = -1;
	}

	else if (y2 == y1) {
		dy = 0;
		s2 = 0;
	}

	else {
		dy = y2 - y1;
		s2 = 1;
	}

	xchange = 0;

	if (dy>dx) {
		temp = dx;
		dx = dy;
		dy = temp;
		xchange = 1;
	}

	e = ((int)dy<<1) - dx;

	for (j=0; j<=dx; j++) {
		//video_pt(x,y,c); //640x480
		VGA_PIXEL(x, y, c);
		//pixel_ptr = (char *)vga_pixel_ptr + (y<<10)+ x;
		// set pixel color
		//*(char *)pixel_ptr = c;

		if (e>=0) {
			if (xchange==1) x = x + s1;
			else y = y + s2;
			e = e - ((int)dx<<1);
		}

		if (xchange==1) y = y + s2;
		else x = x + s1;

		e = e + ((int)dy<<1);
	}
}
```

```
//////////////////////////////////////////////

#define NOP10() asm("nop;nop;nop;nop;nop;nop;nop;nop;nop;nop")

void draw_delay(void){
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
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        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10(); //16
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
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        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10(); //32
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
        NOP10(); NOP10(); NOP10(); NOP10();
```

```
NOP10(); NOP10(); NOP10(); NOP10();
NOP10(); NOP10(); NOP10(); NOP10();
NOP10(); NOP10(); NOP10(); NOP10();
NOP10(); NOP10(); NOP10(); NOP10();
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NOP10(); NOP10(); NOP10(); NOP10();
NOP10(); NOP10(); NOP10(); NOP10();
NOP10(); NOP10(); NOP10(); NOP10(); //48
NOP10(); NOP10(); NOP10(); NOP10();
NOP10(); NOP10(); NOP10(); NOP10();
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NOP10(); NOP10(); NOP10(); NOP10();
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NOP10(); NOP10(); NOP10(); NOP10();
NOP10(); NOP10(); NOP10(); NOP10();
NOP10(); NOP10(); NOP10(); NOP10(); //64
NOP10(); NOP10(); NOP10(); NOP10();
NOP10(); NOP10(); NOP10(); NOP10();
NOP10(); NOP10(); NOP10(); NOP10();
NOP10(); NOP10(); NOP10(); NOP10(); //68
// NOP10(); NOP10(); NOP10(); NOP10();
// NOP10(); NOP10(); NOP10(); NOP10();
// NOP10(); NOP10(); NOP10(); NOP10();
// NOP10(); NOP10(); NOP10(); NOP10();
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// NOP10(); NOP10(); NOP10(); NOP10();
// NOP10(); NOP10(); NOP10(); NOP10();
// NOP10(); NOP10(); NOP10(); NOP10(); //80
// NOP10(); NOP10(); NOP10(); NOP10();
// NOP10(); NOP10(); NOP10(); NOP10();
// NOP10(); NOP10(); NOP10(); NOP10();
```

```
        // NOP10(); NOP10(); NOP10(); NOP10();
        // NOP10(); NOP10(); NOP10(); NOP10();
        // NOP10(); NOP10(); NOP10(); NOP10();
        // NOP10(); NOP10(); NOP10(); NOP10();
        // NOP10(); NOP10(); NOP10(); NOP10();
        // NOP10(); NOP10(); NOP10(); NOP10();
        // NOP10(); NOP10(); NOP10(); NOP10();
        // NOP10(); NOP10(); NOP10(); NOP10();
        // NOP10(); NOP10(); NOP10(); NOP10();
        // NOP10(); NOP10(); NOP10(); NOP10();
        // NOP10(); NOP10(); NOP10(); NOP10();
        // NOP10(); NOP10(); NOP10(); NOP10(); //96
}

int d2b(float num) {
        float num_abs = (num > 0) ? num : num * (-1);
        int decimal = num_abs;
        float frac  = num_abs-decimal;
        int base    =decimal<<21;
        float remain=frac;
        int result=0;
        int i;
        for (i=-1;i>-21;i--){
                if (remain>=pow(2,i)){
                remain-=pow(2,i);
                result=result| 0x1;
           }
           result=result<<1;
        }
        if (num < 0) {
                return ~(result+base) + 0x1;
        }
        return result+base;
}

double b2d(int num) {
        double result = 0;
        int decimal = num & 0x1fffff;
        int i, j;
        for (i = 21; i > 0; i--) {
                result += (decimal & 0x1) /pow(2, i);
                decimal = decimal >> 1;
        }
```

```
        int fraction = num >> 21;
        for (j = 0; j < 4; j++) {
                result += (j == 3) ? (-1 * (fraction & 0x1) * pow(2, j)) : ((fraction & 0x1) * pow(2, j));
                fraction = fraction >> 1;
        }
        return result;
}

void maximum(double *a,double *max,int *max_index, int a_num){
        int i;
        for (i=0;i<a_num;i++){
                //printf("array: %f\n", a[i]);
           if (a[i] > *max){
                   *max= a[i];
                   *max_index = i;
           }
        }
}

void minimum(double *a,double *min, int *min_index, int a_num){
        int i;
        for (i=0;i<a_num;i++){
           if (a[i] < *min){
             *min= a[i];
             *min_index = i;
           }
        }
}

void nms(double *r){
        int i, j, ii, jj;
   for (i=0;i<28;i++){
     for (j=0;j<28;j++){
       double max = 0;
       int idx = 0;
       for (ii=0;ii<3;ii++){
         for (jj=0;jj<3;jj++){
           if( r[(i+ii)*30+j+jj] > max){
             max = r[(i+ii)*30+j+jj];
             idx = (i+ii)*30+j+jj;
           }
         }
       }
       for (ii=0;ii<3;ii++){
```

```
          for (jj=0;jj<3;jj++){
            if ((i+ii)*30+j+jj == idx){
              r[idx]=max;
            }
            else{
              r[(i+ii)*30+j+jj]=0;
            }
          }
        }
      }
    }
}

void getcord(double *r){
  int counter = 0;
  int idx_x = 0;
  int idx_y = 0;
  int i,j;
  for (i=0;i<30;i++){
    for (j=0;j<30;j++){

      if (r[i*30+j] != 0){

        test_data[0][counter+1]=i+1;
        test_data[1][counter+1]=j+1;
        counter+=1;
      }
    }
  }

  test_data[0][0]=counter;
  test_data[1][0]=counter;
}
```