example_plot.py

```
import numpy as np
import matplotlib.pyplot as plt
import serial
import pandas as pd
import csv

#open serial connection
ser = serial.Serial('COM4', 115200)
ser.flushInput()

#enable interactive mode and set the plot as polar
plt.ion()
fig, ax = plt.subplots(subplot_kw={'projection': 'polar'})

#first read, uses this to set up the plot initially
ser_bytes = ser.readline()
decoded_bytes = ser_bytes[0:len(ser_bytes)-2].decode("utf-8")
ydata = np.array(decoded_bytes.split(","))
ydata = ydata.astype(np.float)
print(ydata)
x_angle = np.linspace(0, np.pi, len(ydata))
line, = ax.plot(x_angle, ydata, color='lime', marker='.')

#configure the plot
ax.set_title('RADAR Plot')
ax.set_xlim(0, np.pi)
ax.set_ylim(0,300)
ax.set_facecolor('black')
ax.set_xlabel('Distance from robot (cm)')
ax.grid=True

#variable for toggling the direction of the plotting with the direction of the sensor sweep
toggle = 0

#set up a csv writer
with open("output.csv", "a") as fp:
    wr = csv.writer(fp, dialect='excel')
    #main loop
    while True:
        #read data from the serial line
        ser_bytes = ser.readline()
        #remove end characters
        decoded_bytes = ser_bytes[0:len(ser_bytes)-2].decode("utf-8")
        #split it into an array by commas
        ydata = np.array(decoded_bytes.split(","))
        #convert to floats
        ydata = ydata.astype(np.float)
        #reverse the order of the list every other iteration because the robot will be moving back and f
        if(toggle):
            ydata = np.flip(ydata)
            toggle = 0
```

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        else:
            ydata = np.roll(ydata, -3)
            toggle = 1
        #print out the line of data
        print(ydata)
        #set the data for the line object
        line.set_ydata(ydata)
        #and redraw the line on the plot
        fig.canvas.draw()
        fig.canvas.flush_events()
        #append the data to the csv file to keep a record
        wr.writerow(ydata)
```
