

CSci 343 Fundamentals of Data Science Challenge 1

Submission Window Opens:
Friday, September 8

Points Available:
200 XP for a working demonstration
50 XP for readable & understandable code

Objectives:

- Practice using Python
- Learn the basics of plotting
- Have fun!

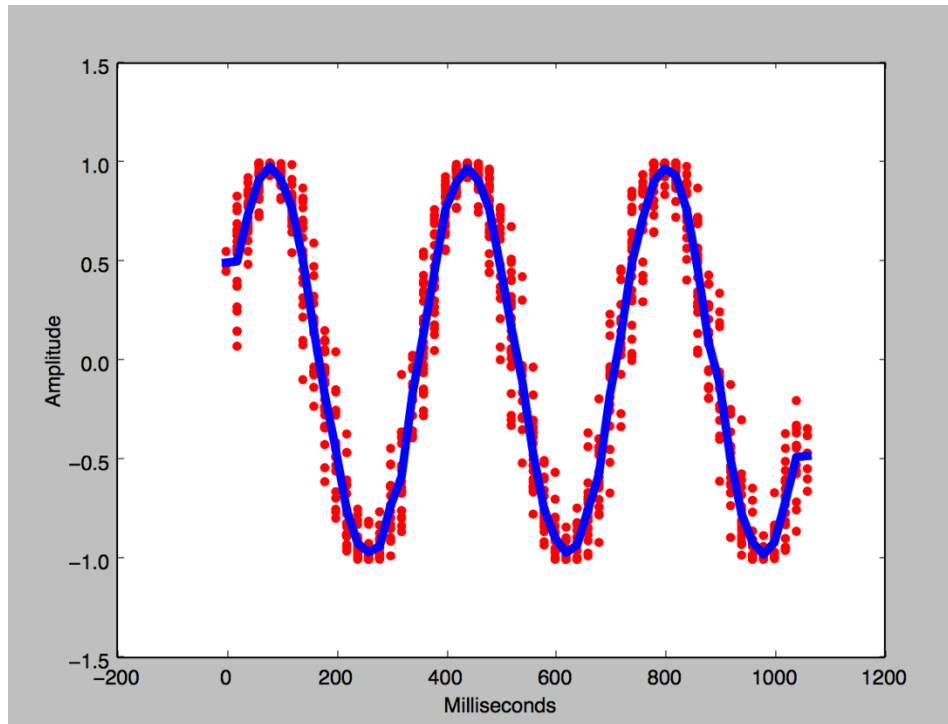
Assignment:

You are a data scientist for the National Weather Service. Usually, you are analyzing weather data, but today something has gone wrong with one of two remote weather stations that transmit their data over radio frequencies to the headquarters. One of the stations has stopped responding! What happened? Zombie apocalypse? Alien invaders? Sentient robot unicorns? Maybe, but it's probably just a blown power relay. These stations are pretty far away, so your boss doesn't want to waste time sending a repair crew to both stations. Before your boss has time to brief the repair team on which station went silent, she is called away to an urgent meeting! Oh, no! The repair crew doesn't know which station to go to. Being a clever data scientist, you suggest that we look at the radio transmission data and see which radio frequency isn't transmitting a signal and which one is. This is your task!

On the class website, you'll find a CSV file for Challenge 1 that has three columns: transmission time in milliseconds, signal amplitude, and FM radio frequency in kHz. You must first find out which radio frequency is generating a structured signal and which is just random noise. Once you've found the correct frequency, then do a scatter plot of the data that was transmitted. Finally, you'll need to draw a line plot of the mean amplitude for each unit time on top of the scatter plot.

I recommend that you first find the unique values in the frequency column of your data file (column 3) and then plot them individually to find the structured data. The plot below is an example of what your final

plot should look like. Your individual plots will look different, but it should be of a similar pattern.



Submission Instructions:

1. Demo your working code to the class TA before uploading it to Blackboard. You cannot proceed to step 2 before doing this.
2. Once your code is working and you've demoed it to the TA, upload all your code to Blackboard as a single ZIP file. Name your ZIP file *spiritAnimal.zip*, where *spiritAnimal* is your class user ID (not your webID or ID number). Be sure to name your main source file "main.py". In a comment at the top of the file, include the following information. Spirit Animal User ID, Date the file was last edited, Challenge Number, and cite any sources that you used as a reference for code, data, and content (including title and URL).