

## CSci 343 Fundamentals of Data Science Challenge 5

*Submission Window Opens:*  
Thursday, November 16  
(Fall Break counts as a WEEKEND!)

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

### Objectives:

- Learn the basics of Polynomial Regression
- Have fun!

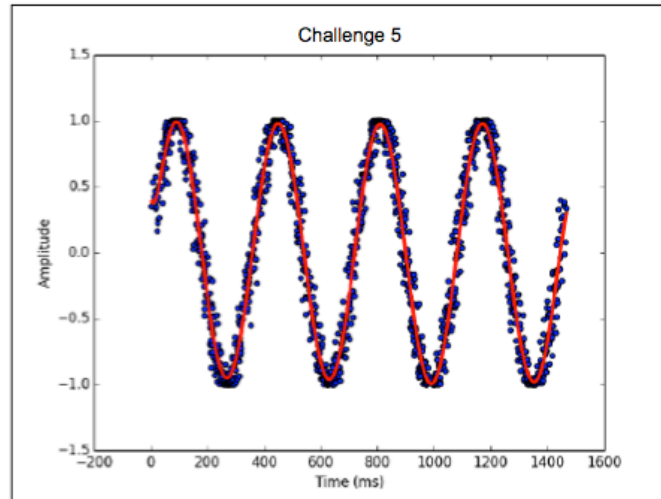
### Assignment:

Remember back at the beginning of the semester when life was simple and the plots were easy? Let's revisit that time but bring our newfound knowledge of polynomial regression with us! Your task will be to take the data that you used in Challenge 1 and create a predictive model of the signal hidden in the data. You will need to use NumPy's `polyfit` and `polyval` functions.

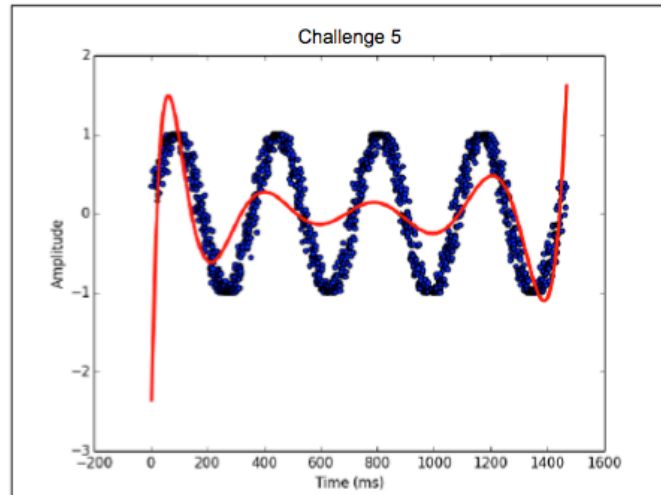
On the class website, you'll find a CSV file for Challenge 1 that has three columns: transmission time in milliseconds, signal amplitude, and FM radio frequency in kHz. You must first find out which radio frequency is generating a structured signal and which is just random noise. Once you've found the correct frequency, then do a scatter plot of the data that was transmitted. Finally, you'll need to do a polynomial regression (using the built-in NumPy functions) of this raw data and plot a regression line on top of the scatter plot. Be sure to try multiple degrees for your polynomial and pick the one that best fits your specific data (everyone in the class has a different dataset).

### Goals:

1. Read in your data file
2. Find the two groups based on third column (you'll have to plot your data and give it a look over to figure this out)
3. Plot only the structured data as a scatter plot
4. Perform a polynomial regression (the exact procedure is on the Course Wiki)  
[http://www.cs.olemiss.edu/~jones/doku.php?id=csci343\\_polynomial\\_regression](http://www.cs.olemiss.edu/~jones/doku.php?id=csci343_polynomial_regression)
5. Plot the regression line on top of the scatter plot (as shown below)



The above is an acceptable regression



The above is NOT an acceptable regression

### 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).