Worksheet 1-1-2 | Working With Data

A. Generate Some Data

First we need to create some fake data to work with. We want a single file, called `data.txt`, which has two columns of numbers – the first column x_i has 100 numbers going from 0 to 1.0, and the second column f_i corresponds to the function

$$f(x) = xe^{-x^2}.$$

Use Python, with NumPy for the arrays and output, to create this file. Be sure to create a new directory in your repository to work in.

B. Plot Some Data

Now plot the data, using these basic steps:

1. Create a Python file called `plot.py`.
2. Use NumPy to read in the text file and assign arrays to each column.
3. Use MatPlotLib to plot the data and display it on the screen.
4. Make the Python file executable so you can run it from the terminal: `$ ./plot.py data.txt`.

Finally, consider some extensions to what you have:

- Comment the file so it's readable to others.
- Include an option to save the plot as a PDF file or PNG image.
- Extend the code to allow more than two columns, and provide an option for which columns to plot.
- Include an option to set the x and y limits of the plot.

Plus whatever else you think will be useful later.

C. GitHub

After showing me that your `plot.py` file works according to the minimum specifications above, push it to your GitHub repository. A working `plot.py` file in the repository will be graded for completion.