SUBMODULE 1.1
WORKING WITH DATA

A. GENERATE SOME DATA

Use NumPy to generate two arrays of data:

- An array named `x`, which holds numbers from 0 to 1 (with a step size of your choice).
- An array named `f`, which holds the numbers corresponding to the function

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

Write the data (in two columns) to a file using NumPy's `savetxt` function.

B. PLOT SOME DATA

In a separate Python file, read in your data using NumPy's `loadtxt` function. Then plot that data using MatPlotLib. View it on the screen and save it as a pdf file.

After that, go back and make the plot have "publishable quality" – that is, it has serif fonts, large enough text, no colour unless necessary, etc.

Finally, make the Python file a proper executable program:

- Put `#!/usr/bin/env python3` at the top of the file and run `chmod u+x` on the file. Then you can call it by doing `./plot.py` rather than invoking python3 every time.
- Then copy your Python script to your bin directory so you can run it from anywhere. If you don't have a bin directory, make one in you home directory.
- Modify your code to accept a file name from the command line, so you can just type `plot.py data.txt` and the data in the file will get plotted for you.

Keep that file around, you'll find it useful!