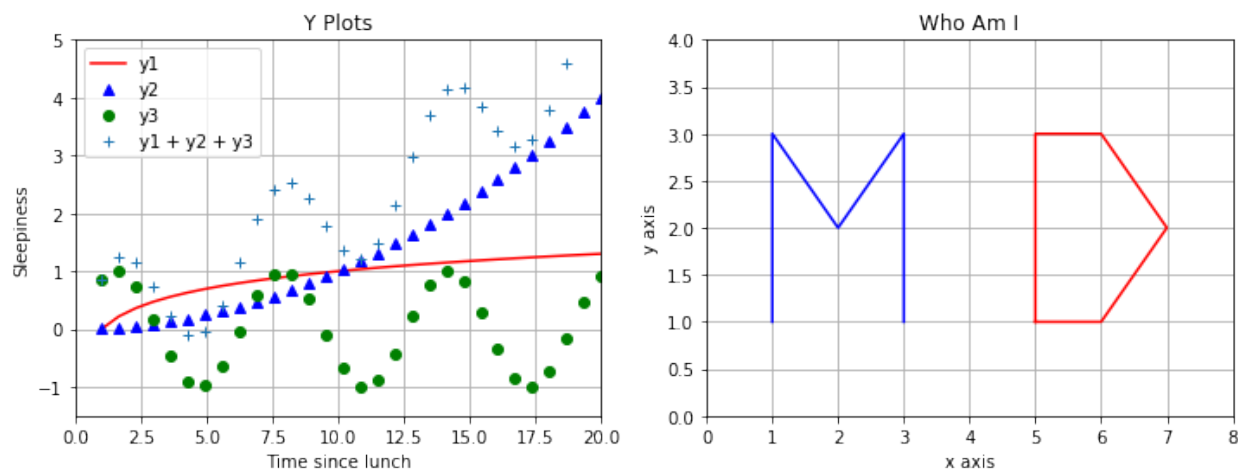


PHYS 453 - Homework 1

Your first(?) python notebook! Everything you need to do these problems can be found in the Python Data Science Handbook and the class Github page.

Problem 1)

Make this plot:



LEFT PANEL: I will tell you that $y_1 = \log_{10} x$ and that $y_2 = Ax^2$ for some constant A . The rest you have to figure out.

RIGHT PANEL: Use your initials, not mine. You may make them look better than mine.

Problem 2)

Every object glows when it gets hot. The equation for the intensity of thermal radiation was discovered by Max Planck:

$$I = \frac{2\pi hc^2}{\lambda^5} \frac{1}{e^{hc/\lambda kT} - 1}$$

Where λ is the wavelength in meters, T is the object's temperature in Kelvin, and constants:

$$h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$$

$$c = 2.99 \times 10^8 \text{ m/s}$$

$$k = 1.381 \times 10^{-23} \text{ J/K}$$

a) Make a **proper** plot (including all axis labels and titles) of I vs λ for a temperature $T = 5800 \text{ K}$. One trick that helps is to make a variable for your x axis in meters and use that to calculate I . But then make a new variable $x_{nm} = x \times 10^{-9}$ that you use to plot your x axis in nanometers.

b) Find the peak intensity and print it, then find the wavelength of the peak intensity and print it. You may find the numpy functions `amax` and `argmax` helpful.