# HW 05 - turn in one week from today in Canvas

Turn in the 3 questions as a single .py file onto canvas. Use comments to clearly indicate which question you are working on. Your filename should end as _py2.py if you use Python2 and _py3.py if you use Python3.

1. I've attached a binary numpy array with five dimensions to canvas in the lecture 05 folder as *five_dim_array.npy*. Load this numpy array. Use np.flatten() to flatten the array. Print the index location of the minimum value of the flattened array.

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2. Plot the lines

$$f(x) = \frac{1}{x} \tag{1}$$

$$g(x) = x \tag{2}$$

$$h(x) = x^2 \tag{3}$$

$$k(x) = x^3 \tag{4}$$

$$\tag{5}$$

on the domain

$$-10 \leq x \leq 10 \tag{6}$$

Label each curve appropriately and provide a legend.
For 3 points of extra credit, use LaTeX to display the math functions as labels in the legend. If you are familiar with LaTeX you can write your labels using scripted math – see `https://matplotlib.org/users/usetex.html` if you want to learn more.

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3. Consider

$$y = 3.7x^2 - 7.0x + 3.1 \tag{7}$$

on the domain from $-1 \leq x \leq 4$ with 50 data points. Randomly generate 50 data points of *noise* from the normal distribution (np.random.normal) with $\mu = 0, \sigma = 5$. Plot the scatter points of $y$ + *noise* with respect to $x$. On the same figure plot the line $y$. Ensure a grid is shown on the figure. Label the x-axis and the y-axis.