McMaster University	W Booth School of Engineering Practice and Technology
SFWRTECH 4AI3 Artificial Intelligence	**Assignment # 2**

Assume the following sample points for input x and output y in the data set where $p_i=(x_i,y_i)$.

$p_1 = (6, 21)$; $p_2 = (10, 40)$; $p_3 = (12, 9)$; $p_4 = (18, 18)$; $p_5 = (20, 60)$; $p_6 = (25, 61)$

Write a program that answers the following questions. The program must be in .ipynb format, and runnable in colab. In the program use separate code blocks to answer each question. The answers must be printed when the program runs.

1) Write the X and Y matrices needed in the Normal Equation.
2) Using the Normal Equation, calculate the parameters of the best linear model representing them. (You may use libraries instructions in your program or write the program from the scratch).
3) Estimate the output at these input points.
4) Calculate the MSE cost function for this set of data.
5) Plot the ground truth output (output given for each sample point in the data set) and the estimated outputs versus inputs in a single figure. Use a scatter plot, and two different colors for the actual and estimated data points.