Problem Statements:

1. Find the average number of times a fair die is thrown by a player in a snakes and ladders game, over a study of million games. Assume that the throw of a fair die follows a uniformly distributed random variable.
   Ladder locations are given by: (Eg. A ladder at 4 leads to 14)
   ladder_start = [4 9 20 28 40 51 63 71]
   ladder_end = [14 31 38 84 59 67 81 91]
   Snake locations are given by: (Eg. A snake at 17 leads to 7)
   snake_head = [17 54 62 64 87 93 95 99]
   snake_tail = [7 34 19 60 24 73 75 78]

2. Write a function to return that row or column of a matrix with the largest element, or both, if the two have equal largest elements. Input to the function should be the matrix, row number and column number.

3. Plot the log of (temperature*pressure*density) of the atmosphere against altitude from sea level to 50 km

4. A company produces products X and Y, both discrete integers. Projections indicate an expected demand of at least 100 X's and 80 Y's per day. No more than 200 X's and 170 Y's can be made per day. As per a contract, a total of at least 200 products much be shipped each day. If each X sold results in a Rs. 2 loss, but each Y produces a Rs.5 profit, how many of each type should be made daily to maximize net profit and find the net profit for these quantities? Do not use pre-defined linear programming solvers.

5. The population of a culture of bacteria was recorded from 27.08 min to 31.25 min, after every 25 s. It turned out be 791, 856, 978, 1050, 1262, 1544, 1650, 2532, 6122, 8170 and 11560. Plot this distribution along with its polynomial curve fit of the 10th order.