Batch 4:

Numpy Practice Questions: Involve the use of basic recursion and DP logic to solve the problems.

Q1. Given the number of rows and columns of a maze, find the total number of possible ways to reach top right (end point) from bottom left (start point).

Example: for rows=cols=2, there are total two ways

for rows=2, cols=3, there are total 3 ways.

Q2. Once you have implemented the above question, lets consider the presence of obstacles as well. Given a maze(matrix), filled with either 0(cell can be used) or 1 (blockage or an obstacle, cell can't be used), find total number of paths to reach top right(end point) from the bottom right(start point).

Examples: Maze: {{0, 0, 0, 0},

{-1, 0, 0, 0},

{0, -1, 0, 0},

{0, 0, 0, 0}}

Total possible ways are 4.

Q3. A number is non-decreasing if every digit (except the first one) is greater than or equal to previous digit. For example, 223, 4455567, 899, are non-decreasing numbers.
So, given the number of digits n, you are required to find the count of total non-decreasing numbers with n digits.

Q4. Given n no. Of coins, find the probability of getting atleast k heads when all n coins are

tossed simultaneously.

Q5. Given a positive number n, find total number of binary numbers that can be generated. Out

of these generated binary numbers, how many binary numbers do not have consecutive ones.

Example: n = 3, five binary numbers: 000, 001, 010, 100, 101

Q6. Given a value N, if we want to make change for N cents, and we have infinite supply of each

of S = { S1, S2, .. , Sm} valued coins, how many ways can we make the change? The order of

coins doesn’t matter.

For example, for N = 4 and S = {1,2,3}, there are four solutions: {1,1,1,1},{1,1,2},{2,2},{1,3}. So output should be 4. For N = 10 and S = {2, 5, 3, 6}, there are five solutions: {2,2,2,2,2}, {2,2,3,3}, {2,2,6}, {2,3,5} and {5,5}. So the output should be 5.