Basics of Python

Challenges

March 17, 2023

1. Given a string str, the task is to print the frequency of each of the characters of str in alphabetical order.
   Input: str = “aabccccddd”
   Output: a2b1c4d3

2. Given an unsorted integer array, the task is to remove the duplicate elements from the array.

3. Given a string, X. Form a string S by repeating string X multiple times i.e appending string X multiple times with itself. There are Q queries of forms i and j. The task is to print “Yes” if the element at index i is the same as the element at index j in S else print “No” for each query.
   Examples :
   Input : X = ”geeksforgeeks”, Q = 3.
   Query 1: 0 8
   Query 2: 8 13
   Query 3: 6 15
   Output :
   Yes
   Yes

4. You are given an m x n integer matrix matrix with the following two properties:

   (a) Each row is sorted in non-decreasing order.

   (b) The first integer of each row is greater than the last integer of the previous row.

   Given an integer target, return true if target is in matrix or false otherwise.

5. Given two integer arrays of same size, “arr[ ]” and “index[ ]”, reorder elements in “arr[ ]” according to given index array.
   Input: arr[ ] = [10, 11, 12];
   index[ ] = [1, 0, 2];
   Output: arr[ ] = [11, 10, 12]
   index[ ] = [0, 1, 2]

6. Given a sorted array of n distinct integers where each integer is in the range from 0 to m-1 and m > n. Find the smallest number that is missing from the array.
   Input: [0, 1, 2, 6, 9], n = 5, m = 10
   Output: 3
   Input: [4, 5, 10, 11], n = 4, m = 12
   Output: 0

7. Given a sequence arr[ ] of size n, Write a function that returns an equilibrium index (if any) or -1 if no equilibrium index exists. The equilibrium index of an array is an index such that the sum of elements at lower indexes is equal to the sum of elements at higher indexes.
   Input: A[ ] = [-7, 1, 5, 2, -4, 3, 0]
   Output: 3
   3 is an equilibrium index, because: A[0] + A[1] + A[2] = A[4] + A[5] + A[6]

8. Given the weights and values of N items, in the form of {value, weight} put these items in a knapsack of capacity W to get the maximum total value in the knapsack. In Fractional Knapsack, we can break items for maximizing the total value of the knapsack.
   Examples: Input: arr[ ] = 60, 10, 100, 20, 120, 30, W = 50
   Output: 240
   Explanation: By taking items of weight 10 and 20 kg and 2/3 fraction of 30 kg. Hence total price will be 60+100+(2/3)(120) = 240

   Input: arr[ ] = 500, 30, W = 10 Output: 166.667

9. Given the NxN grid of horizontal and vertical roads. The task is to find out the number of ways that the person can go from point A to point B using the shortest possible path. Note: A and B point are fixed i.e A is at top left corner and B at bottom right corner as shown in the figure (1)

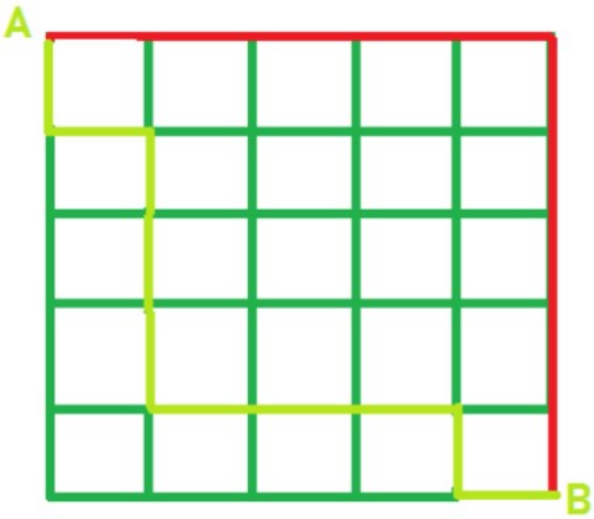

Figure 1: Matrix of Intersections of roads

10. Given a matrix of size r*c. Traverse the matrix in spiral form as shown in figure (2)

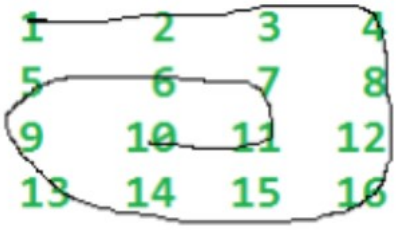

Figure 2: Matrix Traversal in spiral