Problems based on Recursion - 6

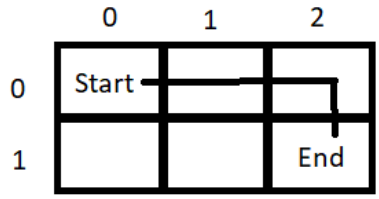
Assignment Questions

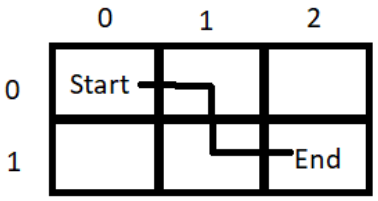
PW SKILLS

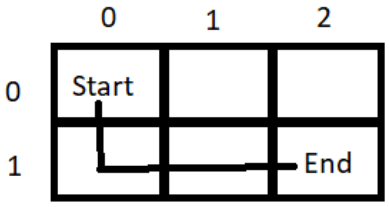
Q1 - Count all the possible paths on an m x n grid from top left (grid[0][0]) to bottom right (grid[m-1][n-1]) having constraints that from each cell you can either move only to right or down. (Easy)

Input1: m = 2, n = 3

Output1: 3







Input2: m = 3, n = 3

Output2: 3

Q2 - Given an array of integers, print a sum triangle from it such that the first level(the bottom level in triangular fashion) has all array elements. From then, at each level, the number of elements is one less than the previous level and elements at the level is the sum of consecutive two elements in the previous level. (Medium)

Input1 : n = 5

arr = {1, 2, 3, 4, 5}

Output1 : [48]

[20, 28]

[8, 12, 16]

[3, 5, 7, 9]

[1, 2, 3, 4, 5]

Explanation :

Here, Level-5: [48]

Level-4: [20, 28] -->(20 + 28 = 48)

Level-3: [8, 12, 16] -->(8 + 12 = 20, 12 + 16 = 28)

Level-2: [3, 5, 7, 9] -->(3 + 5 = 8, 5 + 7 = 12, 7 + 9 = 16)

Level-1: [1, 2, 3, 4, 5] -->(1 + 2 = 3, 2 + 3 = 5, 3 + 4 = 7, 4 + 5 = 9)

Input2 : n = 3
arr = {8, 2, 0}
Output2 : [12]
[10, 2]
[8, 2, 0]

Q3 - Given an array of size n, generate and print all possible combinations of r elements in array. (Hard)

Input1:
n = 4
{1, 2, 3, 4}
r = 2
Output1:
{1, 2}
{1, 3}
{1, 4}
{2, 3}
{2, 4}
{3, 4}

Input2:
n = 5
{1, 2, 3, 4, 5}
r = 3
Output2:
{1, 2, 3}
{1, 2, 4}
{1, 2, 5}
{1, 3, 4}
{1, 3, 5}
{1, 4, 5}
{2, 3, 4}
{2, 3, 5}
{2, 4, 5}
{3, 4, 5}

Q4 - Given two sorted arrays A and B of length m and n respectively, generate all possible arrays such that the first element is taken from A then from B then from A, and so on in increasing order till the arrays are exhausted. The generated arrays should end with an element from B. (Hard)

Input1:

m = 3

n = 4

A = {10, 15, 25}

B = {1, 5, 20, 30}

Output1:

10 20

10 20 25 30

10 30

15 20

15 20 25 30

15 30

25 30

Input2:

m = 2

n = 1

A = {5, 7}

B = {10}

Output2:

5 10

7 10