Section-3	: Programming	Date	: 17-05-2025
Total Marks	: 100	Duration	: 180 Minutes

Instructions:
1. Attempt any 5 out of 7 programs.
2. Use C, C++, C#, JS, or JAVA only

Program-1 Write a program to print n rows of a Pascal's triangle.

Input: n = 5
Output:

```
            1
         1     1
      1     2     1
   1     3     3     1
1     4     6     4     1
```

Program-2 Write a program to print all possible letter combinations that the numbers could represent for a given integer array arr[] containing digits from [0, 9]. A mapping of digits to letters (just like on the telephone buttons) is being followed. Note that 0 and 1 do not map to any letters. All the mapping are shown in the image below:

Input: arr[] = [2, 3]
Output: ad ae af bd be bf cd ce cf
Explanation: When we press 2, 3 then ad, ae, af, bd, ... cf are the list of possible words.

Input: arr[] = [5]
Output: j k l
Explanation: When we press 5 then j, k, l are the list of possible words.

Program-3 Write a program to reverse the string in a way that special characters are not affected. You will be given a string that contains a special character together with alphabets (a to z and A to Z).

Input: a!!!b.c.d,e'f,ghi
Output: i!!!h.g.f,e'd,cba

Input: ab,c,de!$
Output: ed,c,bA!$

Program-4 Write a program to merge two arrays into one, but if any element is repeated in the arrays, it should appear only once, and the duplicates should be replaced with zeros.

Input: Enter the size of first array: 4
Enter the elements of first array: 7 2 5 9
Enter the size of second array: 5
Enter the elements of second array: 5 9 3 7 8

Output: Merged array: 7 2 5 9 0 3 8 0 0

425 900 30 8

Program-5 Write a program to find whether there is a pair of elements in the array whose sum is equal to target. Array size, elements and a target value will be entered by user.

Input:

Array size: 5

Array elements 0: 0

Array elements 1: -1

Array elements 2: 2

Array elements 3: -3

Array elements 4: 1

target = -2

Output: true

Explanation: There is a pair (1, -3) with the sum equal to the given target, 1 + (-3) = -2.

Input:

Array size: 5

Array elements 1: 1

Array elements 1: -2

Array elements 1: 1

Array elements 1: 0

Array elements 1: 5

target = 0

Output: false

Explanation: There is no pair with sum equals to given target.

Program-6 Write a program to print n terms of a Fibonacci series in reverse order.

Input :   n = 5
Output :   3 2 1 1 0

Input :   n = 8
Output :   13 3 5 3 2 1 1 0

Program-7 Write a program to find the sum of elements in Principal and Secondary diagonals of a 2D matrix.

Input: 4

1 2 3 4
4 3 2 1
7 8 9 6
6 5 4 3

Output:
Principal Diagonal: 16
Secondary Diagonal: 20

1

2
ABC

3
DEF

4
GHI

5
JKL

6
MNO

7
PQRS

8
TUV

9
WXYZ

0

X