INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Programming in C and C++ (CSC-101)

Assignment 6

Q-1) Write a program to print all numbers from 1 to 50, but skip those divisible by 3 using `continue` inside a `for` loop.

Q-2) Write a C program that takes an integer input from the user and determines whether the entered number is even or odd using switch case. Note: you are not allowed to use if-else statement.

Q-3) Two numbers are entered through the keyboard. Write a program to find the HCF and LCM of those numbers.

Q-4) Find the maximum of N numbers using a do-while loop.

Q-5) Write a program that takes a number (1–12) and uses a `switch` statement to print how many days are in that month (assume it's not a leap year).

Q-6) Write a C program to print the Fibonacci Series.

Q-7) Write a C program to find the factorial of a number.

Q-8) Write a C program to multiply two numbers without using the * operator.

Q-9) Write a program to find the reverse of a number using do-while, while, for loop.

Q-10) Write a C program to determine whether a given integer n is a power of 2. Additionally, write a separate or the same program to generate the first 50 powers of 2.

Q-11) Write a C program to simulate a calculator where the user enters two integer numbers and an operator (+, -, *, /, %). The program then carries out the specified operation and displays the result. Write using if statements as well as a switch statement.

Q-12) Write a C program to check if the given two numbers are relatively prime or not.

Q-13) Write a C program that takes a decimal number and prints its binary equivalent and then reveres the bits and prints it.

Q-14) Write a C program that does the following:

1) Displays a menu with different modes of transport:

```
1. Bus      - ₹5 per km
2. Car      - ₹10 per km
3. Train    - ₹3 per km
4. Flight   - ₹50 per km
```

2) Prompts the user to enter:

- Choice of transport (1–4)
- Distance to travel in kilometers

3) Uses a `switch` statement to calculate the total cost based on the selected transport and distance.

4) Prints the selected mode of transport, distance, and total price.

Q-15) Write a C program to find the roots of the quadratic equation and display a message that roots are equal or distinct or real or complex.

Q-16) Write a C program to find the median of n unsorted numbers given by the user.

Q-17) Write a C program to print the following pattern

Output

```
Enter number of rows: 7
* * * * * * *
* * * * * *
* * * * *
* * * *
* * *
* *
*
```

Q-18) Write a C program to print the following butterfly pattern

Output

```
Enter the number of rows: 6
*                   *
* *               * *
* * *           * * *
* * * *       * * * *
* * * * *   * * * * *
* * * * * * * * * * *
* * * * * * * * * * *
* * * * *   * * * * *
* * * *       * * * *
* * *           * * *
* *               * *
*                   *
```

Q-19) Write a C program that takes an integer input from the user and prints the given pattern of asterisks (*).

for input value : 4

```
* * * *
*     *
*     *
* * * *
```

for input value : 6

```
* * * * * *
*         *
*         *
*         *
*         *
* * * * * *
```

Q-20) Write a C program to print a right triangle pattern of characters:

At N=5
Output:
A
BB
CCC
DDDD
EEEEE

At n=4
Output:
A
BB
CCC
DDDD

Q-21) C code to print a symmetric number pyramid, where each row forms a centered number pattern (increasing then decreasing)

```
Output
Enter the number of rows: 10
                    1
                  1 2 1
                1 2 3 2 1
              1 2 3 4 3 2 1
            1 2 3 4 5 4 3 2 1
          1 2 3 4 5 6 5 4 3 2 1
        1 2 3 4 5 6 7 6 5 4 3 2 1
      1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
    1 2 3 4 5 6 7 8 9 8 7 6 5 4 3 2 1
  1 2 3 4 5 6 7 8 9 10 9 8 7 6 5 4 3 2 1
```

Q-22) Print square within square for numbers.

```
Output
Enter the value of n: 5
5 5 5 5 5 5 5 5 5
5 4 4 4 4 4 4 4 5
5 4 3 3 3 3 3 4 5
5 4 3 2 2 2 3 4 5
5 4 3 2 1 2 3 4 5
5 4 3 2 2 2 3 4 5
5 4 3 3 3 3 3 4 5
5 4 4 4 4 4 4 4 5
5 5 5 5 5 5 5 5 5
```

Q-23) Write a program to compute:

$$Sum=1-2+3-4+5-6+\ldots\pm n$$

Q-24) Compute the sum:

$$Sum=1!+2!+3!+\ldots+n!$$

Q-25) Write a C program to convert a decimal number to hexadecimal.