Programming Fundamentals

BS (CS) _Fall_2025

Lab_08 Tasks

Learning Objectives:

1. Operators (Unary, Bitwise)
2. While loop

Lab Tasks

Submission Instructions

1. Name each Task question as **i25XXXX_Task<NO>** **e.g.** i250000_Task8.cpp
2. Compress all **.cpp** files into a **.zip** file, and name it as *ROLLNO_SEC_LAB08* **e.g. i25XXXX_A_LAB08.**
3. Now you have to submit this zipped file on Google Classroom.
4. If you don't follow the above-mentioned submission instruction, you will be marked **zero.**
5. Plagiarism in the Lab Task will result in **zero** marks in the whole category.

Zero Tasks

Q1. Perform dry run for the following question

```
#include <iostream>
using namespace std;
int main() {
    int n = 5, fact = 1;
    while (n > 0) {
        if (n % 2 == 1)
            fact *= n;
        n--;
    }
    cout << "Result = " << fact;
    return 0;
}
```

Q2. Write a program to swap two numbers using the XOR (^) operator.

Lab Tasks

Q3. Write a program that asks the user to create a simple encryption system:

- Ask the user to enter a **message in numeric form**.
- Encrypt it using a key (bitwise XOR with a fixed number).
- Keep asking for input until the user enters 0.
- Then decrypt all messages and display them back.

Q4. Write a program that inputs a number and checks if a given number is a power of two (e.g., 1, 2, 4, 8, 16...).

Q5. Write a program that takes an integer and checks if its binary representation is a palindrome.

- Use a **while loop** to reverse bits.
- Use **if condition** to compare original vs reversed binary.

Example: Input = 9 (1001) → Output: Palindrome.

Q6. Write a program that plays **Rock, Paper, Scissors** between the computer and the user. The user enters their choice:

- r for Rock
- p for Paper
- c for Scissors

The computer's choice will be determined using the following logic:

Ask the user to enter any integer value.

- If value % 3 == 0, the computer chooses **Rock (r)**.
- If value % 3 == 1, the computer chooses **Paper (p)**.
- If value % 3 == 2, the computer chooses **Scissors (c)**.

The game is played for **3 rounds**.

The winner is decided on the basis of who wins more rounds.

If the score is tied after 3 rounds, play **one extra round** to decide the final winner.

Rules of the Game

- Rock beats Scissors (Rock smashes Scissors).
- Scissors beats Paper (Scissors cut Paper).
- Paper beats Rock (Paper wraps Rock).
- If both choices are the same, it is a **tie**.