**Lab Task#6**

1. Which loop system would be better for user input. Justify your answer by creating a program that takes a value and adds it to a variable and prints it repeatedly until the user enters a zero value.
2. Write a program that calculates the factorial of a given number using a loop.

e.g. Input: n = 5 Output: 5! = 120

1. Write a program that counts how many even and odd numbers are present in the first n natural numbers. e.g.: input: n = 10, Output: Even = 5, Odd = 5
2. Write a program that calculates the sum of all even numbers up to n using loops. e.g. Input: n = 10, Output: Sum of even numbers = 30
3. Write a program that takes an integer as input and prints its reverse using loops.

e.g. Input: n = 1234, Output: Reversed = 4321

1. Write a program to find the Least Common Multiple (LCM) of two numbers using loops. e.g. Input: a = 12, b = 15, Output: LCM = 60
2. Write a program to implement the Collatz Conjecture. Starting with any positive integer n, the next term is obtained by:

* If n is even, divide it by 2.
* If n is odd, multiply it by 3 and add 1.
* The conjecture is that no matter what number you start with, you will always reach 1 eventually. Print the sequence for a given number. e.g. Input: n = 7, Output: 7 → 22 → 11 → 34 → 17 → 52 → 26 → 13 → 40 → 20 → 10 → 5 → 16 → 8 → 4 → 2 → 1.

1. Write a program which inputs the 25 student’s marks (out of 100) and counts the number of failed and passed students. How many students are excellent and how many are above average.

**Note:** Passing marks = 50, A+ = 90 – 100 (Outstanding), A = 86 - 89 (Excellent), B+ = 75 – 85 (Good), B- = 70 – 74 (Average), C+ = 66 – 69 (Below Average), C = 62 – 65 (Adequate), C- = 58 – 61 (Pass), D+ 54 – 57 (Pass), D = 50 – 53 (Pass).

1. You are requested to write a program which will be used to take the entry test for university students. The program must have following features.

* For correct answer, students get 4 marks.
* For wrong answer, student lose 1 mark.
* If the student answers first four questions wrong exit the program with a message “Sorry, you did not qualify for the admission.”
* If students score 20 marks, program should display “Congratulations, you have qualified for the admission “and exit.
* There will be only 4 options for each question