Objective of the Lab session:

To learn and write programs on switch case constructs, if else logic, Multiple Statements within if, Nested if-elses, else if

1. Write a C program to find maximum between three numbers.
2. Write a C program to check whether a number is negative, positive or zero.
3. Write a C program to check whether a number is divisible by 5 and 11 or not.
4. Write a C program to check whether a year is leap year or not.

   Note: Input year from user. Store it in some variable say year. If year is exactly divisible by 4 and not divisible by 100, then it is leap year. Or if year is exactly divisible by 400 then it is leap year.
5. Write a C program to input any character and check whether it is alphabet, digit or special character.
6. Write a C program to check whether a character is uppercase or lowercase alphabet.
7. Write a C program to input week number and print week day.
8. Write a C program to find all roots of a quadratic equation.

   Note: a quadratic equation is an equation in the form of

   $$ax^2 + bx + c = 0$$

   A quadratic equation can have either one or two distinct real or complex roots depending upon nature of discriminant of the equation. Where discriminant of the quadratic equation is given by:

   $$\Delta = b^2 - 4ac$$

Depending upon the nature of the discriminant, formula for finding roots is be given as.

- Case 1: If **discriminant is positive**. Then there are two real distinct roots given by.

$$\frac{-b+\sqrt{\Delta}}{2a} \quad \text{and} \quad \frac{-b-\sqrt{\Delta}}{2a}$$

- Case 2: If **discriminant is zero** then, it has exactly one real root given by.

$$-\frac{b}{2a}$$

- Case 3: If **discriminant is negative** then, it has two distinct complex roots given by.

$$\frac{-b}{2a}+i\frac{\sqrt{-\Delta}}{2a} \quad \text{and} \quad \frac{-b}{2a}-i\frac{\sqrt{-\Delta}}{2a}$$

9. Write a C program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade according to following:
   Percentage >= 90% : Grade A
   Percentage >= 80% : Grade B
   Percentage >= 70% : Grade C
   Percentage >= 60% : Grade D
   Percentage >= 40% : Grade E
   Percentage < 40% : Grade F

10. Write a C program to input electricity unit charges and calculate total electricity bill according to the given condition:
    For first 50 units Rs. 0.50/unit
    For next 100 units Rs. 0.75/unit
    For next 100 units Rs. 1.20/unit
    For unit above 250 Rs. 1.50/unit
    An additional surcharge of 20% is added to the bill