Assignment 3
Topics: Conditional Statements

Section A3.1: [If-Else Statements]

- A3.1a: Write a C program to check if a number entered by the user is positive, negative, or zero using if-else statements.

- A3.1b: Create a program to determine if a user-input year is a leap year. A year is a leap year if it is divisible by 4 but not by 100, except when it is divisible by 400.

- A3.1c: Write a program that takes four numbers as input and prints the largest of the four using if-else statements.

- A3.1d: [Bonus] Develop a program to accept the marks of a student in three subjects and display the result as "Pass" or "Fail". A student is considered to have passed if they have a minimum of 35 marks in each subject and an overall average of 40 marks. Use nested if-else statements to check the conditions.

Section A3.2: [Nested If-Else Statements]

- A3.2a: Write a program to input the age of a person and determine which age group they belong to: Child (0-12), Teenager (13-19), Adult (20-59), or Senior (60 and above) using nested if-else statements.

- A3.2b: Create a program that accepts a student's grade as input (A, B, C, D, F) and prints out a message indicating whether they have "Excellent," "Good," "Average," "Below Average," or "Fail" performance using nested if-else.

- A3.2c: Develop a program to accept a character input from the user and determine if it is an uppercase letter, lowercase letter, digit, or a special character using nested if-else statements.

- A3.2d: [Bonus] Write a program that simulates a basic login system. The user should enter a username and password. Use nested if-else statements to check the credentials and display "Login Successful" if they match the predefined values. If either the username or password is incorrect, display an appropriate error message.

Section A3.3: [Conditional (Ternary) Operator]

- A3.3a: Write a program using the conditional operator to check whether a given number is even or odd.

- A3.3b: Create a program to find the smallest of three numbers using the conditional operator.

- A3.3c: Develop a program to input the marks of a student and use the conditional operator to determine if the student has passed or failed. Assume passing marks are 40.

- A3.3d: [Bonus] Write a program to check whether a year is a leap year using a nested conditional (ternary) operator.

Section A3.4: [Switch Statement]

- A3.4a: Write a C program using the switch statement to print the day of the week given the day number (1 for Monday, 2 for Tuesday, etc.).

- A3.4b: Create a program that accepts a grade (A, B, C, D, F) and uses the switch statement to print the corresponding description: "Excellent," "Good," "Average," "Below Average," "Fail."

- A3.4c: Develop a calculator program using the switch statement. The program should accept two numbers and an operator (+, -, *, /) and perform the appropriate calculation.

- A3.4d: [Bonus] Write a program to create a simple menu-driven application using the switch statement. The menu should allow the user to select a basic arithmetic operation (addition, subtraction, multiplication, division). After performing the operation, the program should ask if the user wants to perform another calculation or exit.

Section A3.5: [Use of Break and Without Using Break in Switch Statements]

- A3.5a: Write a program using the switch statement to print the season (Winter, Spring, Summer, Autumn) based on the month number (1 for January, 2 for February, etc.). Use the break statement to exit the switch after printing the season.

- A3.5b: Create a program to demonstrate a switch statement without the break statement. Accept a number from 1 to 3 and print "One," "Two," and "Three." Notice how the output changes when break statements are not used.

- A3.5c: Develop a program using a switch statement without breaks to determine if a number is in the range of 1-5, 6-10, or greater than 10. Use the switch to group cases together without using break statements.

- A3.5d: [Bonus] Write a program that uses a switch statement to categorize an alphabet as a vowel or consonant. Implement the program both with and without using the break statement and observe the difference in outputs.
