Department of Electrical Engineering

Faculty Member:

Lab Engineer: Muhammad Ali Khalid **Dated:**

Semester: 1st **Section: BEE15 ()**

CS-114 Fundamentals of Programming

Lab No. 5: Decision Making using if-else and Switch Statements Contd...

		PLO4/ CLO3		PLO10/ CLO4	PLO8/ CLO5	PLO9/ CLO6
Name	Reg. No	Viva / Quiz / Lab Performance 5 Marks	Analysis of data in Lab Report 5 Marks	Modern Tool Usage 5 Marks	Ethics and Safety 5 Marks	Individual and Teamwork 5 Marks

Problem Solving:

Task 1: Write a program that reads a three-digit number from the user and then prints on screen if the given number is an Armstrong number or not?

Task 2: Any character is entered through the keyboard; write a program to determine whether the character entered is a capital letter, a small letter, a digit, or a special symbol. The following table shows the range of ASCII values for various characters.

Characters	ASCII Values
A – Z	65 – 90
a – z	97 – 122
0 – 9	48 – 57
special symbols	0 - 47, 58 - 64, 91 - 96, 123 - 127

Task 3: Write a program using if/else operator with nested statements to find the grade of a student.

The detail is as follow.

grade >= 90 Grade A

grade >= 80 Grade B

grade >=70 Grade C

grade >=60 Grade D

Task 4: Write a program in C to input a single character and print a message— "It is vowel" if it is vowel otherwise print message "It is a constant"— Use if/else structure and OR (||) operator only.

Task 5: Make a program in C using nested if-else that tells the form of Water whether it is Ice, Water or Steam. Display the menu also as under.

HINT:

- Temperature Less than 0 = ICE
- Temperature Greater than 0 & Less than 100 = Water
- Temperature Greater than 100 = STEAM

Task 6: Write a program using nested if-else to compute the real roots of the equation:

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

Task 7: To determine whether a person is overweight or obese, one can use a measure called the body mass index (BMI). The formula for BMI is

$$BMI = \frac{weightInPounds \times 703}{heightInInches \times heightInInches}$$

or

$$BMI = \frac{weightInKilograms}{heightInMeters \times heightInMeters}$$

Create a BMI calculator application that reads the user's weight in pounds and height in inches (or, if you prefer, the user's weight in kilograms and height in meters), then calculates and displays the user's body mass index. Also, the application should display the following information from the Department of Health and Human Services/National Institutes of Health so the user can evaluate his/her BMI:

```
BMI VALUES
Underweight: less than 18.5
Normal:      between 18.5 and 24.9
Overweight:  between 25 and 29.9
Obese:       30 or greater
```

Task 8: [use switch statement] Write a program that returns the name of a day of the week given the day number, as following:

Number	Day of week
1	Saturday
2	Sunday
3	Monday
4	Tuesday
5	Wednesday
6	Thursday
7	Friday
anything else	error

What You Should See

```
Weekday 1: Saturday
Weekday 2: Sunday
Weekday 3: Monday
Weekday 4: Tuesday
Weekday 5: Wednesday
Weekday 6: Thursday
Weekday 7: Friday

Weekday 17: error
Weekday -1: error
```

Task 9: Perform Task No. 3 and Task No. 5 using switch statement.

Task 10: Create a program that acts as a basic calculator. It should perform addition, subtraction, multiplication, and division based on user input.

- Prompt the user to enter an operator (+, -, *, /).
- Ask for two operands.
- Perform the corresponding operation and display the result.
- Ensure that division by zero is handled appropriately.

Use a switch statement to implement the operation selection.