**Bangladesh-Bharot Digital Service for Employment & Training (BDSET)**

**Module: Python Programming**

**Lab 02  
Problem Solving using Basics of Python for Artificial Intelligence**

**String Formatting**

 **Concatenation**:

* Example: print("Hello, " + name + "!")

 **Using format() method**:

* Example: print("Hello, {}!".format(name))

 **Formatted String Literals (f-strings)**:

* Example: print(f"Hello, {name}!")

 **Formatting Numbers**:

* Example: print(f"The value of pi is approximately {3.14159:.2f}")

**Simple and Complex Decisions Using "if-else" Statements**

 **Syntax**:

if condition:

# code block

 **Execution Flow**: How the program decides whether to execute the block inside if.

 **Example**:

age = 18

if age >= 18:

print("You are an adult.")

**Point**: Indentation and (:)

**Adding Else Block**

**Logical Operators**:

* + 1. **and**: **Both** conditions **must be true**.

if age >= 18 and age < 65:

print("You are eligible.")

* + 1. **or**: **At least one** condition **must be true**.

if age < 18 or age >= 65:

print("Special rules apply.")

* + 1. **not**: **Reverses** the condition.

if not is\_raining:

print("You can go outside.")

* **Truth Table**: Create a simple truth table for and, or, and not to clarify how they work.

**Example**

 Combining multiple conditions:

if (age >= 18 and income > 30000) or has\_scholarship:

print("Eligible for a loan.")

 Using nested if statements:

if score >= 50:

if score >= 75:

print("Distinction!")

else:

print("Pass")

else:

print("Fail")

 Using elif for multiple conditions:

if grade >= 90:

print("A")

elif grade >= 80:

print("B")

elif grade >= 70:

print("C")

else:

print("Fail")

Exercise:

Even Odd

Positive, Negative and zero etc

Make a calculator using (+, -, \*, /)

Make a grading System by taking Marks as input and provide grade in output (F, A+, A, A-, B, C, D)

**Triangle Type Checker**  
Input the three sides of a triangle and determine if it is:

* An equilateral triangle (all sides equal),
* An isosceles triangle (two sides equal),
* A scalene triangle (no sides equal).

**Exercise:**

1. Write a program that convert percentage to decimal.

Example: Enter percentage: 125%

Equivalent decimal: 1.25

1. Write a program to convert temperature from Centigrade (C’) to Fahrenheit (F’)

Far=1.8Cel+32

1. Write a program that asks the user to enter a whole number of inches and convert that length to feet and inches. See the following figure. The program should use both integer division and the modulus operator.

Examples: Enter number of Inches: 185

185 inches if 15 feet and 5 inches

1. A copy center charges 50 won per copy for the first 100 copies and 30 won per copy for each additional copy.

Write a program that requests the number as input and displays the total cost.

1. A calendar year divisible by four is a leap year, with the exception of the years ending in 00 (that is, those divisible by 100) and not divisible by 400. For instance the years 1600 and 2000 are leap years, but 1700, 1800, and 1900 are not.

Write a program that requests a year as input and states whether it is a leap year.