**Implementing Control Structures.**

**Objective**:

Practice solving decision-making scenarios using advanced if-else statements and complex switch cases to control program flow by evaluating variable values and program states.

**Description**

In this activity, you'll use if-else statements and switch cases to control program flow in scenarios like tax calculations and phone plan selection. You'll then apply these skills to create a gym membership fee system and a bank account management system.

**Problem 1: Membership Fee Calculation System**

**Problem Statement:**

You are developing a program to calculate the membership fee for a gym. The fee depends on the user’s age and membership type:

* For users under 18, the fee is $15 for a basic membership and $25 for a premium membership.
* For users between 18 and 60, the fee is $30 for a basic membership and $50 for a premium membership.
* For users over 60, the fee is $20 for a basic membership and $35 for a premium membership.

**Instructions:**

Write an advanced if-else statement to calculate the membership fee based on age and membership type.

**Code:**

**namespace** **MembershipFeeCalcSys**

{

**public** **class** **Program**

{

**public** **static** **void** **Main**()

{

// Step 1: Input age

Console.WriteLine("Enter your age:");

**string?** ageInput = Console.ReadLine();

**if** (!**int**.TryParse(ageInput, **out** **int** age) || age < **0**)

{

Console.WriteLine("Invalid age input");

**return**;

}

// Step 2:

Console.WriteLine("Enter membership type (basic/premium):");

**string?** membershipInput = Console.ReadLine();

**if** (**string**.IsNullOrWhiteSpace(membershipInput))

{

Console.WriteLine("Invalid membership type.");

**return**;

}

**string** membershipType = membershipInput.Trim().ToLower();

**double** fee = **0**;

**if** (age < **18**)

{

**if** (membershipType == "basic")

{

fee = **15**;

}

**else** **if** (membershipType == "premium")

{

fee = **25**;

}

**else**

{

Console.WriteLine("Unknown membership type.");

**return**;

}

}

**else** **if** (age >= **18** && age <= **60**)

{

**if** (membershipType == "basic")

{

fee = **30**;

}

**else** **if** (membershipType == "premium")

{

fee = **50**;

}

**else**

{

Console.WriteLine("Unknown membership type.");

**return**;

}

}

**else** **if** (age > **60**)

{

**if** (membershipType == "basic")

{

fee = **20**;

}

**else** **if** (membershipType == "premium")

{

fee = **35**;

}

**else**

{

Console.WriteLine("Unknown membership type.");

**return**;

}

}

// Step 4: Output the result

Console.WriteLine($"The membership fee is: ${fee}");

}

}

}

**Problem 2: Bank Account Management System**

**Problem Statement:**

You are developing a bank account management system. The program must manage different types of bank accounts and apply the correct fees or interest rates based on the account type:

* **Savings Account**: Apply a 2% interest rate.
* **Checking Account**: Apply a $10 monthly fee.
* **Business Account**: Apply a 1% interest rate and a $20 monthly fee.
* For all other account types, display an error message.

**Instructions:**

Write a switch case to handle different account types and apply the correct fees or interest rates.

**Code:**

**namespace** **BankAccountManagSyst**

{

**public** **class** **Program**

{

**public** **static** **void** **Main**()

{

// Step 1: Get user input for account type

Console.WriteLine("Enter account type (savings/checking/business):");

**string?** accountInput = Console.ReadLine();

**if** (**string**.IsNullOrWhiteSpace(accountInput))

{

Console.WriteLine("Invalid input.");

**return**;

}

**string** accountType = accountInput.Trim().ToLower();

**double** balance = **10000.00**; // Example for demonstration

**double** interestRate = **0**, monthlyFee = **0**;

// Step 2: Use switch-case to determine behavior

**switch** (accountInput)

{

**case** "savings":

interestRate = **0.02**; // 2% interest

**double** interest = balance \* interestRate;

balance += interest;

Console.WriteLine($"Savings account: +2% interest applied. New balance: ${balance:F2}");

**break**;

**case** "checking":

monthlyFee = **10.0**;

balance -= monthlyFee;

Console.WriteLine($"Checking account: $10 monthly fee deducted. New balance: ${balance:F2}");

**break**;

**case** "business":

interestRate = **0.01**; // 1% interest

monthlyFee = **20.0**;

balance += balance \* interestRate;

balance -= monthlyFee;

Console.WriteLine($"Business account: +1% interest and $20 fee applied. New balance: ${balance:F2}");

**break**;

**default**:

Console.WriteLine("Unknown account type. Please enter savings, checking, or business.");

**break**;

}

}

}

}