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)
```

```csharp
{
    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();
```

```csharp
            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;

            }
        }
    }
}
```