**Debugging code**

**Objective:**

Demonstrate how to use basic debugging techniques and tools, such as setting breakpoints, inspecting variable values, and stepping through code to identify and fix errors.

**Description:**

This activity will guide participants through debugging C# code, including identifying errors, understanding their causes, and applying fixes. It will start with two fully debugged examples and then provide two additional debugging problems for learners to solve. Common error types, such as syntax, runtime, and logical errors, will be addressed.

**Set Up Your Environment**

* Use the Visual Studio Code console application you created at the start of the course. Remove any existing code in the Program.cs file of your console application.
* Copy and edit the code in this activity into the Program.cs file to complete the steps.

**Problem 1: Calculating Discounts**

**Problem Description:**

The code below is meant to calculate the final price after applying a discount to a product. However, it does not produce the correct output due to a logical error.

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

{

// Method to calculate the final price after a discount

**public** **static** **double** **ApplyDiscount**(**double** price, **double** discountPercentage)

{

**return** price - discountPercentage;

}

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

{

**double** finalPrice = ApplyDiscount(**1000**, **15**);

Console.WriteLine("The final price is: " + finalPrice);

}

}

**Code:**

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

{

// Method to calculate the final price after applying a percentage discount

**public** **static** **double** **ApplyDiscount**(**double** price, **double** discountPercentage)

{

// Error checks

**if** (price < **0**)

{

**throw** **new** **ArgumentException**("Price cannot be negative.");

}

**if** (discountPercentage < **0** || discountPercentage > **100**)

{

**throw** **new** **ArgumentException**("Discount percentage must be between 0 and 100.");

}

// Calculate the discount

**double** discountAmount = price \* (discountPercentage / **100**);

**return** price - discountAmount;

}

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

{

**try**

{

**double** finalPrice = ApplyDiscount(**1000**, **15**); // Valid input

Console.WriteLine("The final price is: " + finalPrice);

// Uncomment to test error handling:

// double invalid = ApplyDiscount(-200, 10); // Negative price

// double invalid = ApplyDiscount(500, 150); // Invalid discount percentage

}

**catch** (ArgumentException ex)

{

Console.WriteLine("Error: " + ex.Message);

}

}

}