Programming with C#

# Garbage Collector and Dispose Practice

## Implement a Destructor

1. Open Visual Studio if it is not already open.
2. Click File, New Project
3. Select Visual C# in the Templates pane and then Console Application in the middle pane.
4. Name the project GarbageCollectionPractice and choose a folder to save the project in.
5. Add a new class to the project and call it Calculator
6. In the Calculator.cs file, add the following code:  
     
   **// Constructor  
   public Calculator()   
   {   
    Console.WriteLine("Calculator being created");   
   }  
     
   // Public Divide method  
   public int Divide(int first, int second)   
   {   
    return first / second;   
   }  
     
   // Destructor  
   ~Calculator()   
   {   
    Console.WriteLine("Calculator being finalized");   
   }**
7. Switch to Program.cs and enter the following code into the Main() method:  
     
   **Calculator calculator = new Calculator();   
   Console.WriteLine("{0} / {1} = {2}", 120, 15, calculator.Divide(120, 15)); Console.WriteLine("Program finishing");**
8. Click Debug, Start Debugging or press F5 to run the application.
9. Fix any errors that may occur.
10. Verify the output in the console window and the close the application.

## Implement the IDisposable Interface

1. Using the same project, switch back to your Calculator.cs file
2. Modify the Calculator class to implement the IDisposable interface
3. As a result, you now need to implement the Dispose method so enter the following code in the Calculator class:  
     
   **public void Dispose()   
   {   
    Console.WriteLine("Calculator being disposed");   
   }**
4. Then, in the destructor, add the following line of code to call the dispose method:  
     
   **this.Dispose();**
5. Switch back to Program.cs and modify the code:

**using (Calculator calculator = new Calculator())  
{   
 Console.WriteLine("{0} / {1} = {2}", 120, 15, calculator.Divide(120, 15));   
}**

1. Run the application again with F5.
2. Verify that the “**Calculator being disposed**” message is displayed.
3. Press Enter to stop the application and return to Visual Studio.
4. When disposing of objects, you should not do so more than once. Modify the Calculator class to include the following code:  
     
   **private bool disposed = false;**
5. Modify the Dispose() method with this code:  
     
   **if (!this.disposed)   
   {   
    Console.WriteLine("Calculator being disposed");   
   }   
     
   this.disposed = true;**
6. Run the application again and notice the messages output to the console. The destructor is running but the instance is only discarded once.
7. Press Enter to close the application and return to Visual Studio.
8. At the end of the code you just modified, add this line of code to suppress finalize when the garbage collector runs:  
     
   **GC.SuppressFinalize(this);**
9. Run the application again and notice the difference in the output.
10. Stop the application.
11. Select Close Solution.
12. Close Visual Studio for now as this practice is complete.