Day18 Assignment

By

Narala Praveen

16-Feb-2022

Question1:
What is the use of XML?

Use:

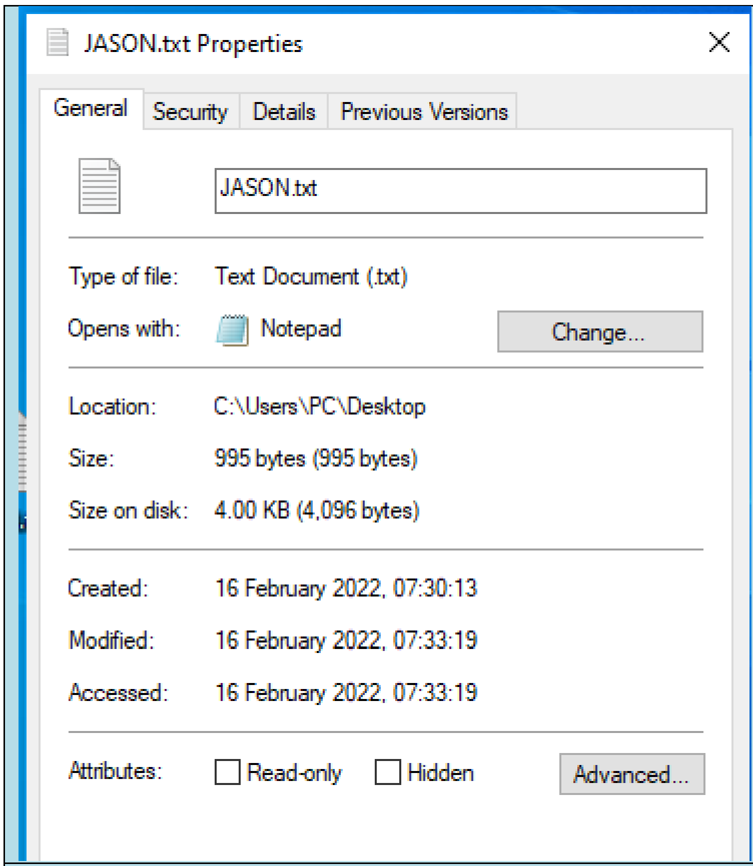
1. **XML (Extensible Mark-up Language) is used for universal data transfer Mechanism to send data across different platforms.**
2. **XML can be used for offloading and reloading of databases.**
3. **XML can be used to store and arrange the data ,Which can Customize your data handling needs.**
4. **XML can easily be merged with style sheets to create almost any desired output.**

Question2:
Write the points discussed about XML in the class?

XML: Extensive Mark up Language.

1. **XML have user defined Tags.**
2. **XML has only one root tag.**
3. **XML is case Sensitive.**
4. **There are two types of XML**
   a. **Tag based XML.**
   b. **Attribute base XML.**
5. **Attribute base XML occupies less memory than Tag base XML.**
6. **Attribute base XML minimizes the code.**

Comparison of size of files:
JASON File size:



JASON.txt Properties

General | Security | Details | Previous Versions

JASON.txt

Type of file: Text Document (.txt)

Opens with: Notepad

Location: C:\Users\PC\Desktop

Size: 995 bytes (995 bytes)

Size on disk: 4.00 KB (4,096 bytes)

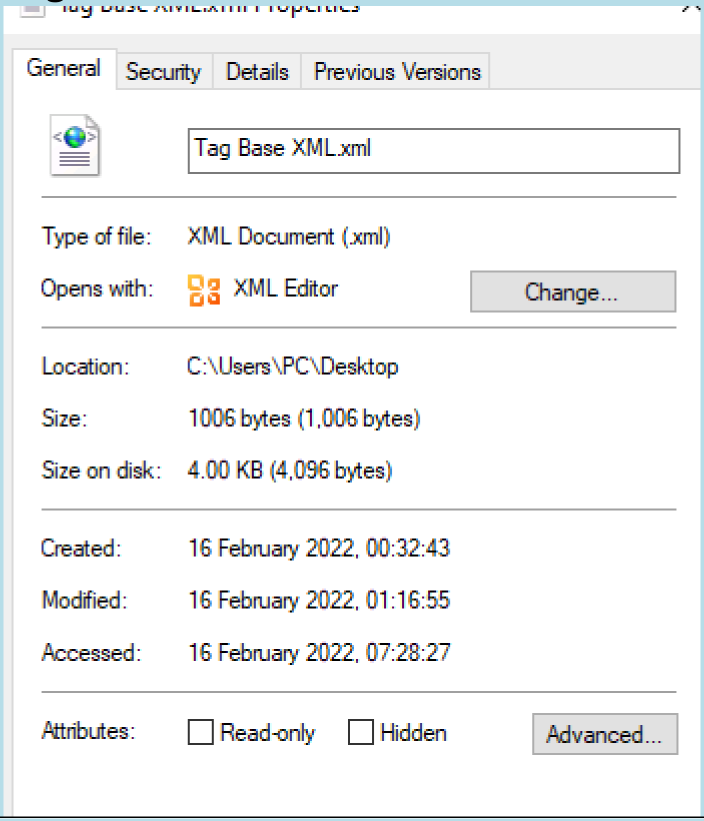
Created: 16 February 2022, 07:30:13

Modified: 16 February 2022, 07:33:19

Accessed: 16 February 2022, 07:33:19

Attributes: ☐ Read-only ☐ Hidden

Tag base XML:



General | Security | Details | Previous Versions

Tag Base XML.xml

Type of file: XML Document (.xml)

Opens with: XML Editor

Location: C:\Users\PC\Desktop

Size: 1006 bytes (1,006 bytes)

Size on disk: 4.00 KB (4,096 bytes)

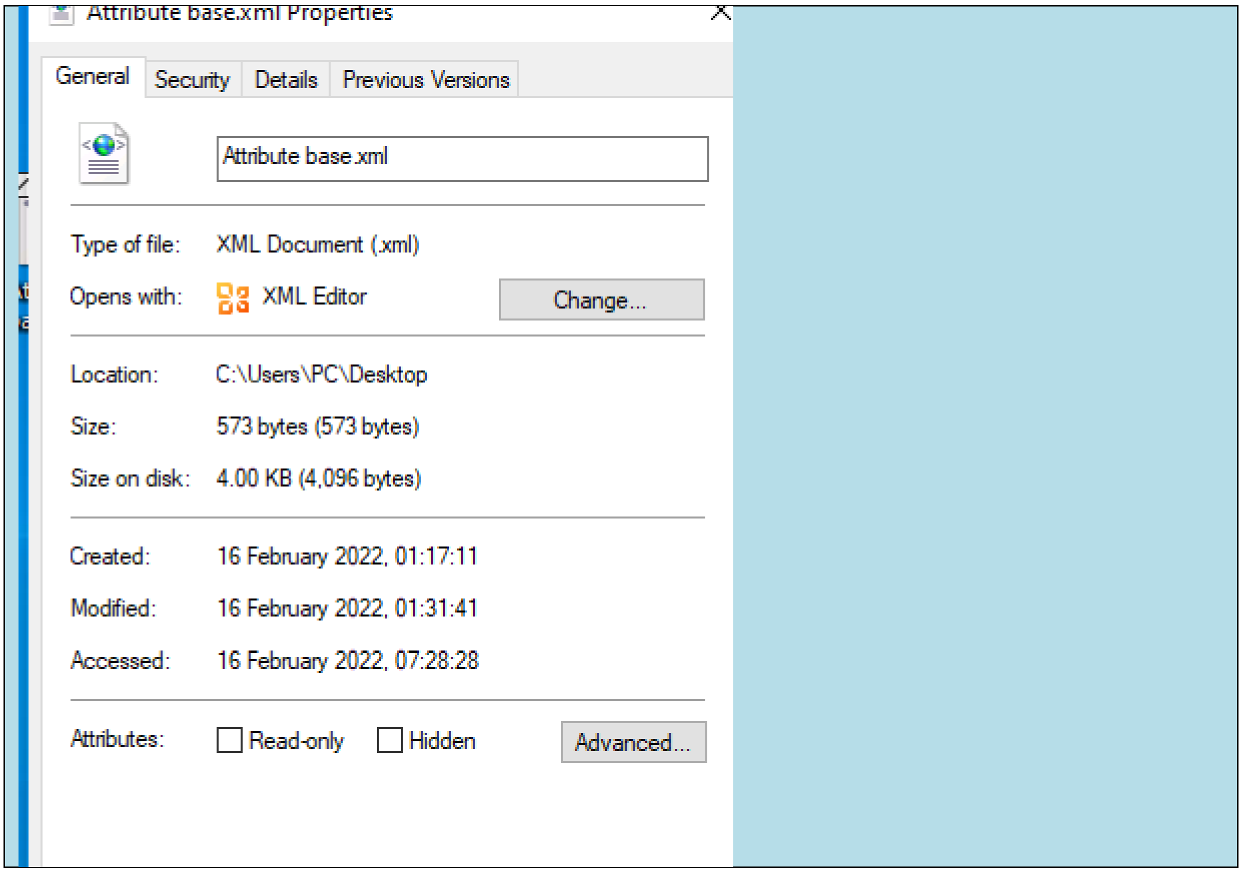
Created: 16 February 2022, 00:32:43

Modified: 16 February 2022, 01:16:55

Accessed: 16 February 2022, 07:28:27

Attributes: ☐ Read-only ☐ Hidden

Attribute base XML:


Attribute base.xml Properties

General | Security | Details | Previous Versions

Attribute base.xml

Type of file: XML Document (.xml)
Opens with: XML Editor
Location: C:\Users\PC\Desktop
Size: 573 bytes (573 bytes)
Size on disk: 4.00 KB (4,096 bytes)
Created: 16 February 2022, 01:17:11
Modified: 16 February 2022, 01:31:41
Accessed: 16 February 2022, 07:28:28
Attributes: ☐ Read-only ☐ Hidden

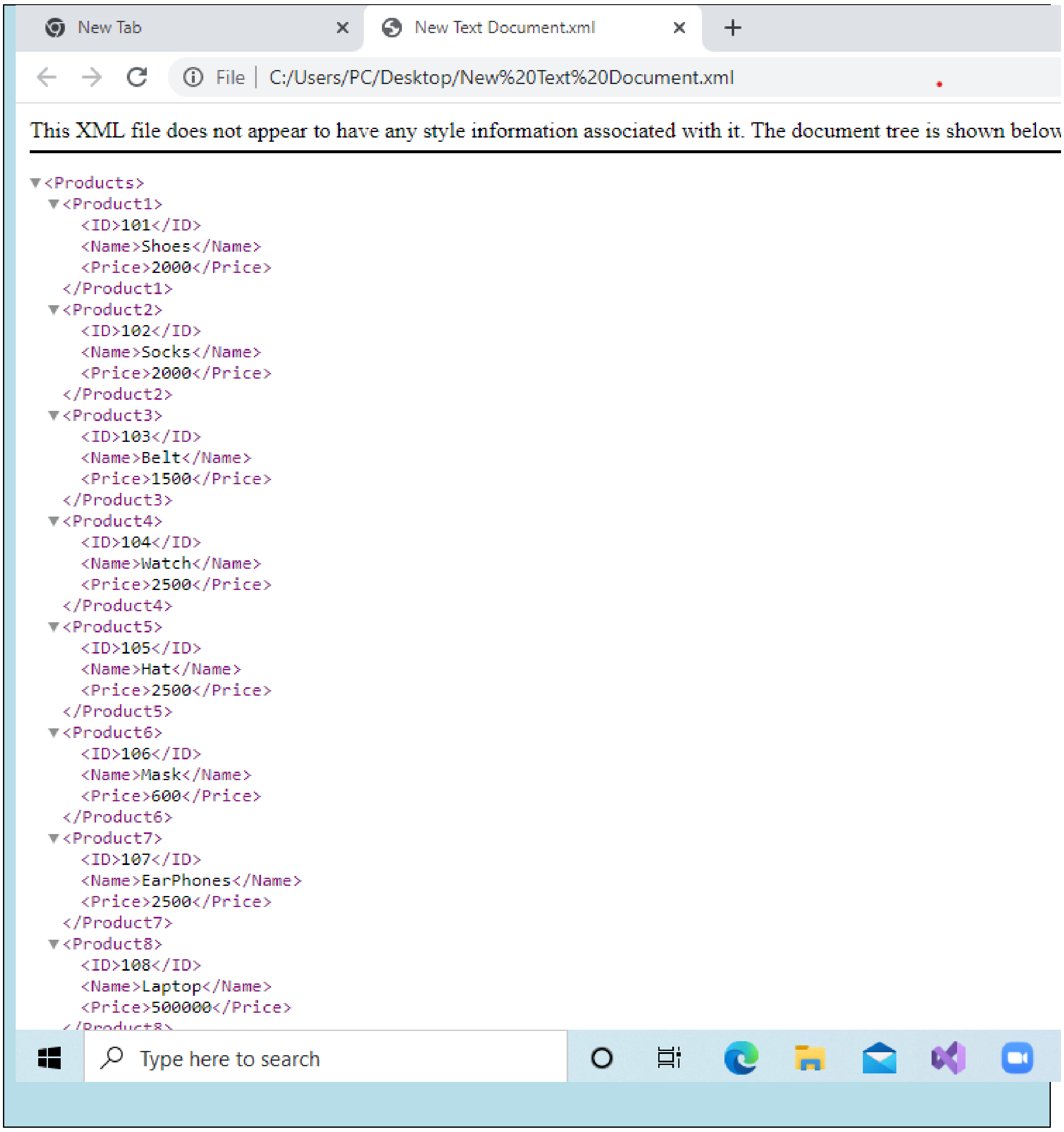
Question3:
Create a simple XML to illustrate:

a. **Tag based XML with 10 Products.**
b. **Attribute based XML.**

Code for Tag based XML:

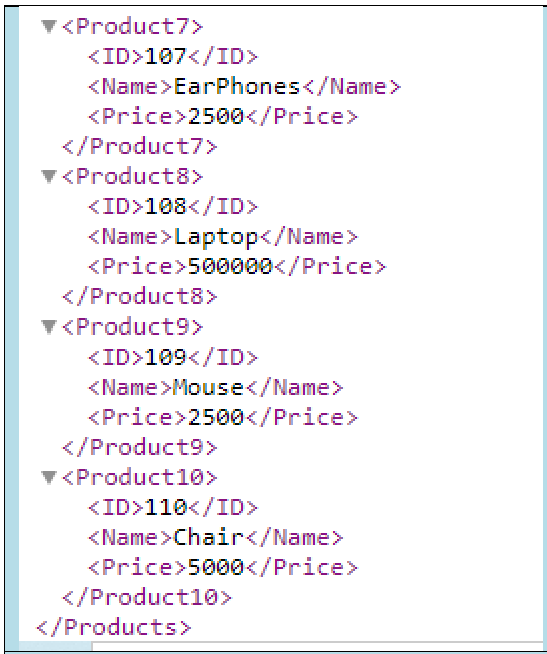
```
<Products>
 <Product1>
  <ID>101</ID>
  <Name>Shoes</Name>
  <Price>2000</Price>
</Product1>
<Product2>
  <ID>102</ID>
  <Name>Socks</Name>
  <Price>2000</Price>
</Product2>
<Product3>
  <ID>103</ID>
  <Name>Belt</Name>
  <Price>1500</Price>
 </Product3>
 <Product4>
  <ID>104</ID>
  <Name>Watch</Name>
  <Price>2500</Price>
  </Product4>
  <Product5>
  <ID>105</ID>
  <Name>Hat</Name>
  <Price>2500</Price>
  </Product5>
  <Product6>
  <ID>106</ID>
  <Name>Mask</Name>
  <Price>600</Price>
```

```xml
  </Product6>
  <Product7>
   <ID>107</ID>
   <Name>EarPhones</Name>
   <Price>2500</Price>
  </Product7>
  <Product8>
   <ID>108</ID>
   <Name>Laptop</Name>
   <Price>500000</Price>
  </Product8>
  <Product9>
   <ID>109</ID>
   <Name>Mouse</Name>
   <Price>2500</Price>
  </Product9>
  <Product10>
   <ID>110</ID>
   <Name>Chair</Name>
   <Price>5000</Price>
  </Product10>
</Products>
```



This XML file does not appear to have any style information associated with it. The document tree is shown below

```
▼<Products>
  ▼<Product1>
     <ID>101</ID>
     <Name>Shoes</Name>
     <Price>2000</Price>
   </Product1>
  ▼<Product2>
     <ID>102</ID>
     <Name>Socks</Name>
     <Price>2000</Price>
   </Product2>
  ▼<Product3>
     <ID>103</ID>
     <Name>Belt</Name>
     <Price>1500</Price>
   </Product3>
  ▼<Product4>
     <ID>104</ID>
     <Name>Watch</Name>
     <Price>2500</Price>
   </Product4>
  ▼<Product5>
     <ID>105</ID>
     <Name>Hat</Name>
     <Price>2500</Price>
   </Product5>
  ▼<Product6>
     <ID>106</ID>
     <Name>Mask</Name>
     <Price>600</Price>
   </Product6>
  ▼<Product7>
     <ID>107</ID>
     <Name>EarPhones</Name>
     <Price>2500</Price>
   </Product7>
  ▼<Product8>
     <ID>108</ID>
     <Name>Laptop</Name>
     <Price>500000</Price>
   </Product8>
```

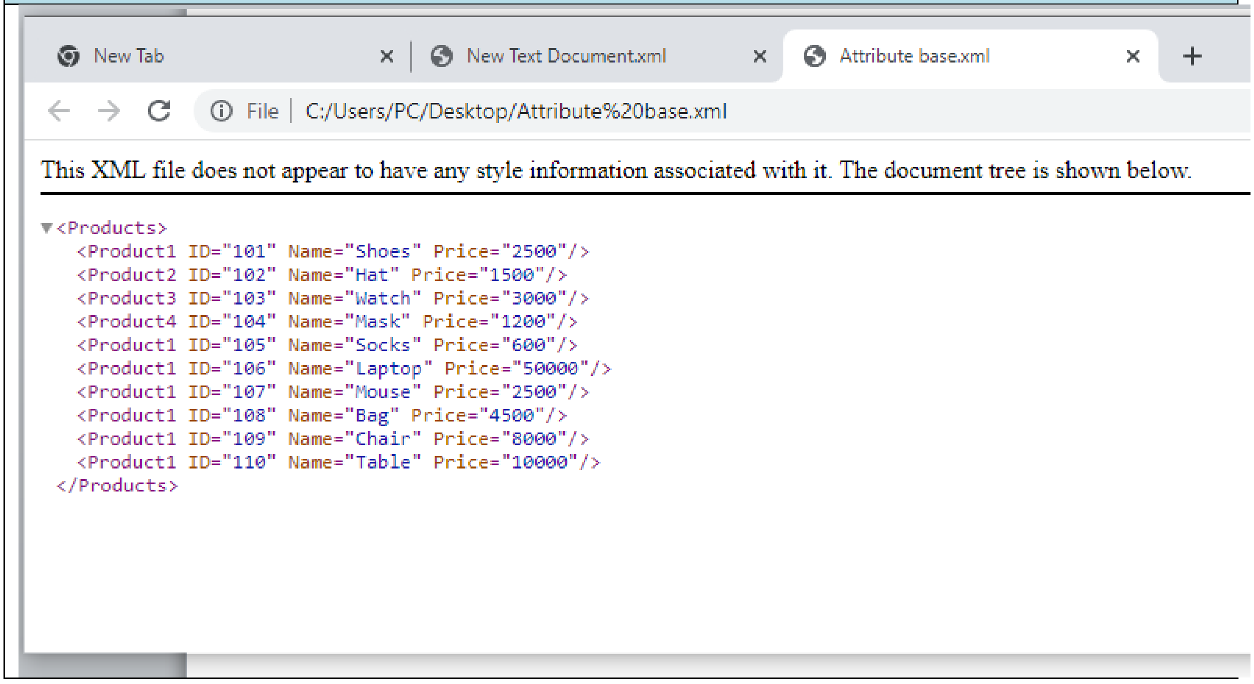


```
▼<Product7>
    <ID>107</ID>
    <Name>EarPhones</Name>
    <Price>2500</Price>
  </Product7>
▼<Product8>
    <ID>108</ID>
    <Name>Laptop</Name>
    <Price>500000</Price>
  </Product8>
▼<Product9>
    <ID>109</ID>
    <Name>Mouse</Name>
    <Price>2500</Price>
  </Product9>
▼<Product10>
    <ID>110</ID>
    <Name>Chair</Name>
    <Price>5000</Price>
  </Product10>
</Products>
```

Attribute base XML:

```
<Products>

  <Product1 ID="101" Name="Shoes" Price="2500" />

  <Product2 ID="102" Name="Hat" Price="1500" />

  <Product3 ID="103" Name="Watch" Price="3000" />

  <Product4 ID="104" Name="Mask" Price="1200" />

  <Product1 ID="105" Name="Socks" Price="600" />

  <Product1 ID="106" Name="Laptop" Price="50000" />

  <Product1 ID="107" Name="Mouse" Price="2500" />

  <Product1 ID="108" Name="Bag" Price="4500" />

  <Product1 ID="109" Name="Chair" Price="8000" />

   <Product1 ID="110" Name="Table" Price="10000" />
```

```
</Products>
```



This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
▼<Products>
   <Product1 ID="101" Name="Shoes" Price="2500"/>
   <Product2 ID="102" Name="Hat" Price="1500"/>
   <Product3 ID="103" Name="Watch" Price="3000"/>
   <Product4 ID="104" Name="Mask" Price="1200"/>
   <Product1 ID="105" Name="Socks" Price="600"/>
   <Product1 ID="106" Name="Laptop" Price="50000"/>
   <Product1 ID="107" Name="Mouse" Price="2500"/>
   <Product1 ID="108" Name="Bag" Price="4500"/>
   <Product1 ID="109" Name="Chair" Price="8000"/>
   <Product1 ID="110" Name="Table" Price="10000"/>
 </Products>
```

Question4:
Convert the above XML to JSON and display the JSON data?

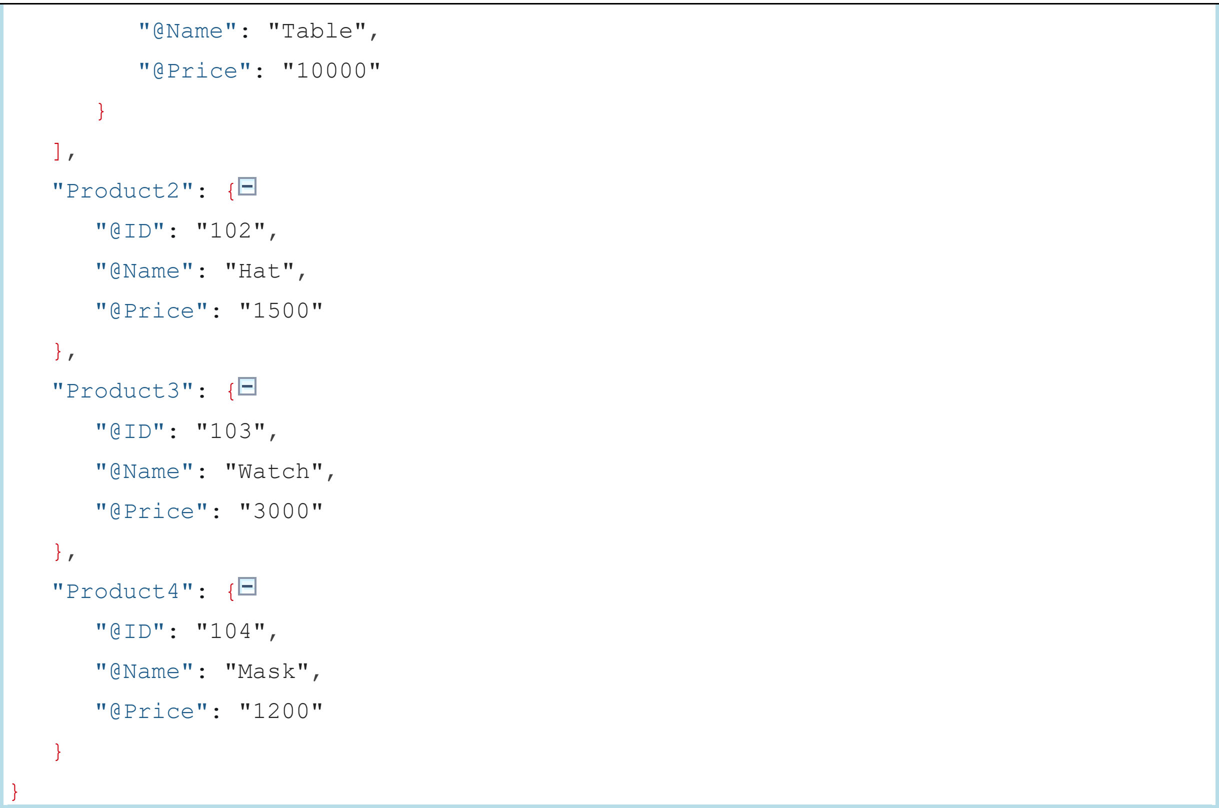
Attribute base XML:

```
<Products>

 <Product1 ID="101" Name="Shoes" Price="2500" />

 <Product2 ID="102" Name="Hat" Price="1500" />

 <Product3 ID="103" Name="Watch" Price="3000" />

 <Product4 ID="104" Name="Mask" Price="1200" />

 <Product1 ID="105" Name="Socks" Price="600" />

 <Product1 ID="106" Name="Laptop" Price="50000" />

 <Product1 ID="107" Name="Mouse" Price="2500" />
```

```
  <Product1 ID="108" Name="Bag" Price="4500" />

  <Product1 ID="109" Name="Chair" Price="8000" />

   <Product1 ID="110" Name="Table" Price="10000" />

</Products>
```

JASON CODE:

```
{
   "Product1": [
      {
         "@ID": "101",
         "@Name": "Shoes",
         "@Price": "2500"
      },
      {
         "@ID": "105",
         "@Name": "Socks",
         "@Price": "600"
      },
      {
         "@ID": "106",
         "@Name": "Laptop",
         "@Price": "50000"
      },
      {
         "@ID": "107",
         "@Name": "Mouse",
         "@Price": "2500"
      },
      {
         "@ID": "108",
         "@Name": "Bag",
         "@Price": "4500"
      },
      {
         "@ID": "109",
         "@Name": "Chair",
         "@Price": "8000"
      },
      {
         "@ID": "110",
```



```
        "@Name": "Table",
        "@Price": "10000"
      }
  ],
  "Product2": {
     "@ID": "102",
     "@Name": "Hat",
     "@Price": "1500"
  },
  "Product3": {
     "@ID": "103",
     "@Name": "Watch",
     "@Price": "3000"
  },
  "Product4": {
     "@ID": "104",
     "@Name": "Mask",
     "@Price": "1200"
  }
}
```

Question5: **Research and write the benefits of JSON over XML?**
Advantages:
1. **JASON(Javascript Object Notation) is light weight comparison with XML.** 2. **XML is much more difficult to parse than JASON by using XML parser.** 3. **JSON parses data faster than XML by using standard JavaScript function. JSON is parsed into a ready to use JavaScript object.** 4. **JSON requires less tags than XML(XML items must be wrapped in open and close tags whereas in JASON just name the tag once.**

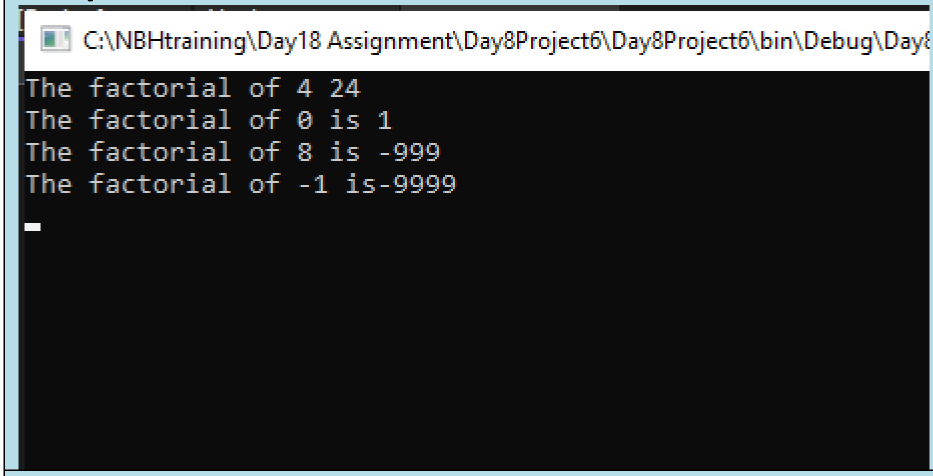
Question 6:
For the below requirement ,create a layered architecture
Project with separate class library for business logic.
Create console application
Create windows application
Business Requirements
0 = 1
Positive number(up to 7)=factorial answer
>7=-999(as answer)
<0=-999
Put the screen shots of the output and project (Solution explorer)
Screen shot?

Code:
Library code:
```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Maths
{
    public  class Algebra
    {
        int n;
        public static int Factorial(int n)
        {
            if (n == 0)
            {
                return 1;
            }
            else if (n > 7)
            {
                return -999;
            }
            else if (n < 0)
            {
                return -9999;
            }
            else
            {
                int fact = 1;
                for (int i = 1; i <= n; i++)

                    fact = fact * i;
                    return fact;
            }

        }
    }
}
```

Code for console application:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using Maths;

namespace Day8Project6
{
    internal class Program
    {
        static void Main(string[] args)
        {
            Console.WriteLine($"The factorial of 4 {Algebra.Factorial(4)}");
            Console.WriteLine($"The factorial of 0 is {Algebra.Factorial(0)}");
            Console.WriteLine($"The factorial of 8 is {Algebra.Factorial(8)}");
            Console.WriteLine($"The factorial of -1 is{Algebra.Factorial(-1)}");
            Console.ReadLine();
        }
    }
}
```

Output:



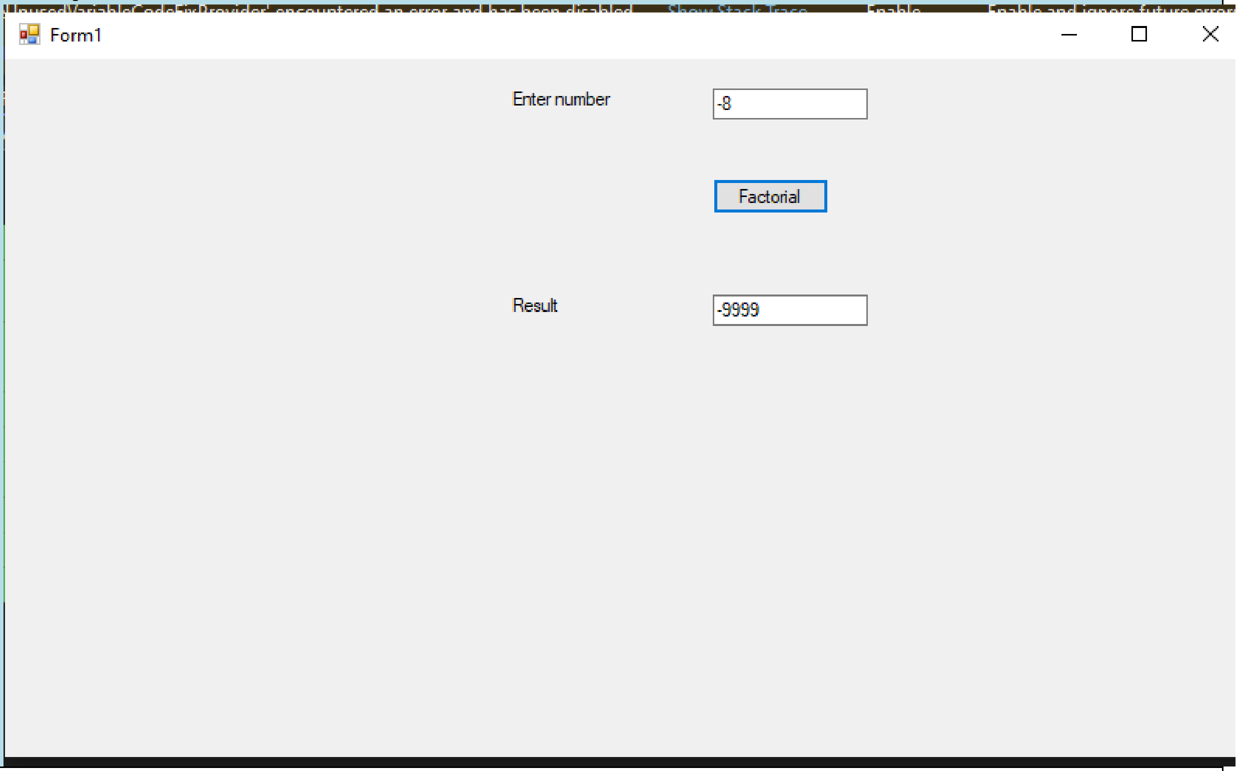
C:\NBHtraining\Day18 Assignment\Day8Project6\Day8Project6\bin\Debug\Day8

```
The factorial of 4 24
The factorial of 0 is 1
The factorial of 8 is -999
The factorial of -1 is-9999
```

Code for windows application:

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;
using Maths;

namespace WindowsFormsApp1
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void label1_Click(object sender, EventArgs e)
        {

        }

        private void button1_Click(object sender, EventArgs e)
        {

            int n = Convert.ToInt32(textBox1.Text);
            int result=Algebra.Factorial(n);
            textBox2.Text = result.ToString();

        }
    }
}
```

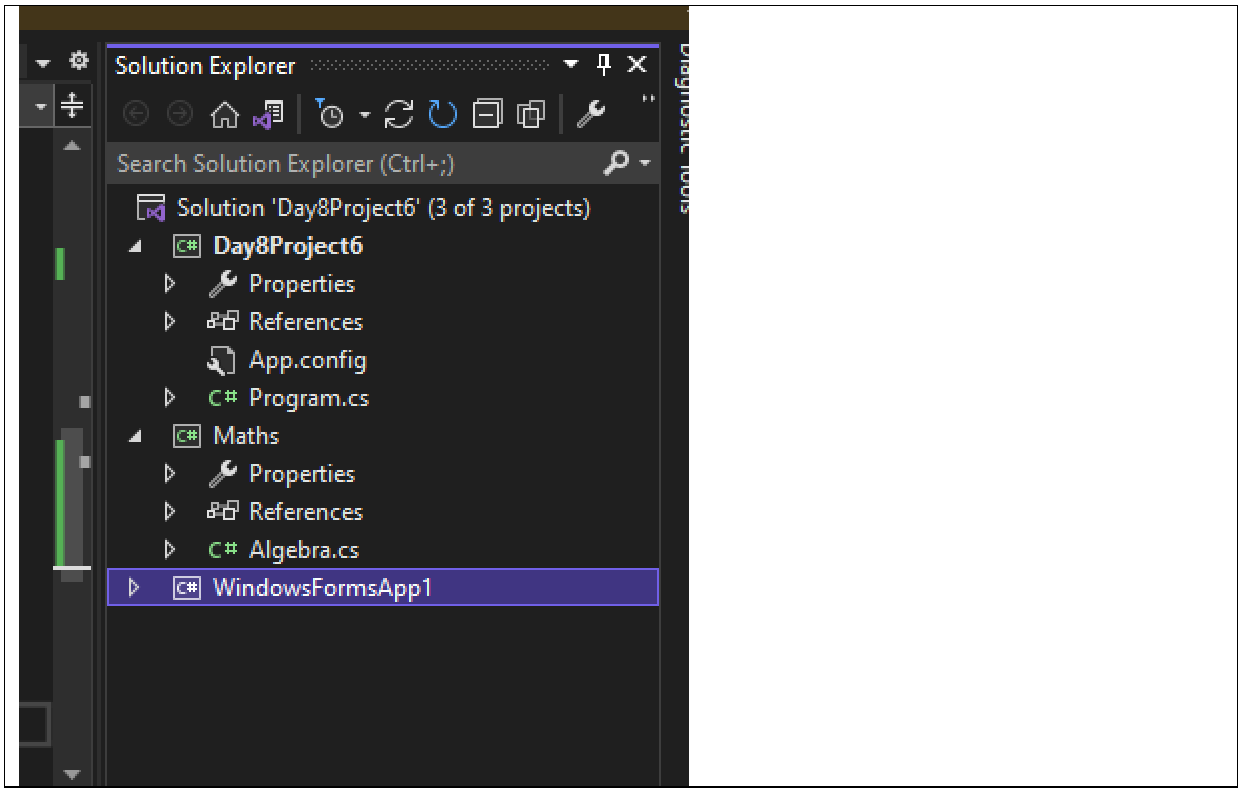
Output:



Enter number -8

Result -9999

Screen shot of solution explorer:



Solution Explorer

Search Solution Explorer (Ctrl+;)

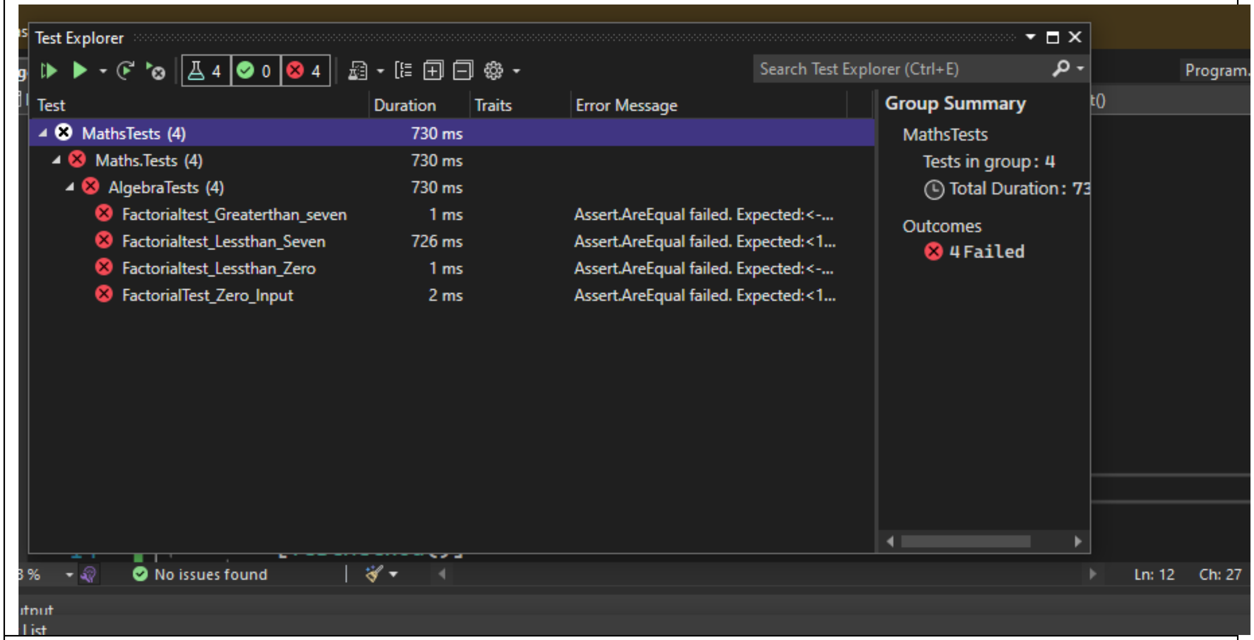
```
Solution 'Day8Project6' (3 of 3 projects)
◢ Day8Project6
    ▷ Properties
    ▷ References
      App.config
    ▷ Program.cs
◢ Maths
    ▷ Properties
    ▷ References
    ▷ Algebra.cs
▷ WindowsFormsApp1
```

Question 7:
For the above method, implement TDD and write 4 test cases and put the code in word document.
Put the screen shot of all test cases failing
Make the test cases pass.
Put the screen shot.

Code:

```
using Microsoft.VisualStudio.TestTools.UnitTesting;
using Maths;
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Maths.Tests
{
    [TestClass()]
    public class AlgebraTests
    {
        [TestMethod()]
        public void FactorialTest_Zero_Input()
        {
            //Arrange
            int n = 0;
            int expected = 1;

            //Act
            int actual=Algebra.Factorial(n);

            //Assert
            Assert.AreEqual(expected, actual);
        }
        [TestMethod()]
        public void Factorialtest_Greaterthan_seven()
        {
            //Arrange
            int n = 8;
            int expected = -999;

            //Act
            int actual = Algebra.Factorial(n);

            //Assert
            Assert.AreEqual(expected, actual);

        }
        [TestMethod()]
        public void Factorialtest_Lessthan_Zero()
        {
            //Arrange
            int n = -2;
            int expected = -9999;

            //Act
            int actual=Algebra.Factorial(n);
            //Assert
            Assert.AreEqual(expected, actual);
        }
        [TestMethod()]
        public void Factorialtest_Lessthan_Seven()
        {
            //Arrange
            int n = 5;
            int expected = 120;

            //Act
            int actual = Algebra.Factorial(n);

            //Assert
            Assert.AreEqual(expected, actual);

        }
    }
}
```

Tests fail:



Test Explorer

Search Test Explorer (Ctrl+E)

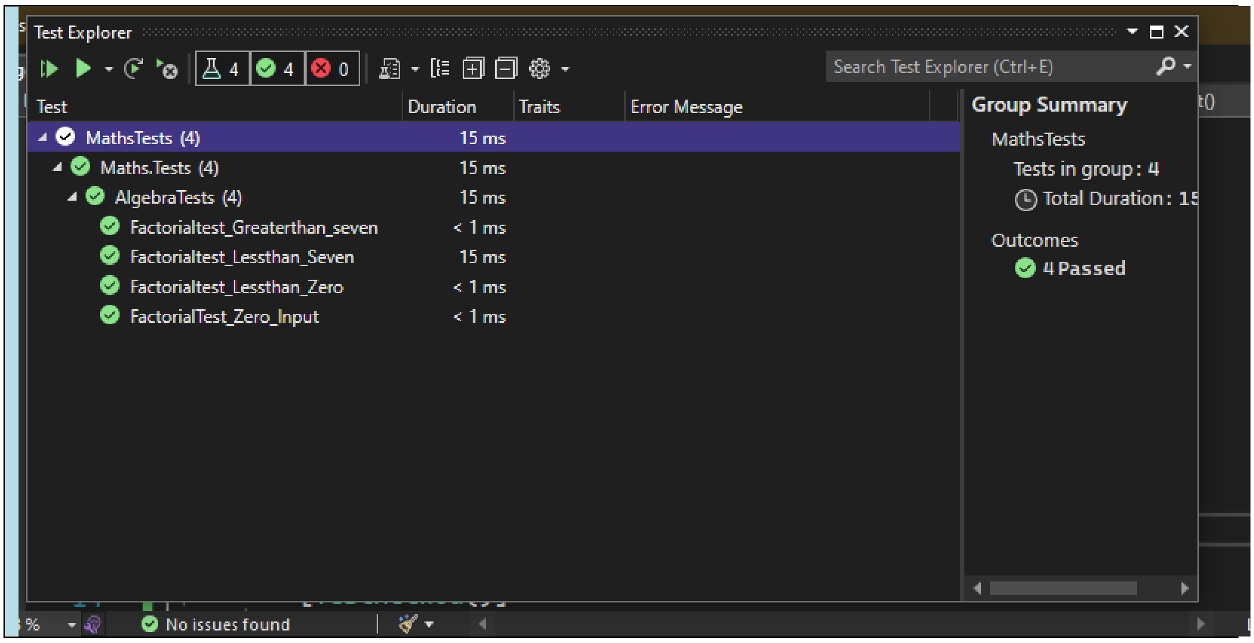
```
Test                                   Duration  Traits  Error Message
MathsTests (4)                         730 ms
  Maths.Tests (4)                      730 ms
    AlgebraTests (4)                   730 ms
      Factorialtest_Greaterthan_seven  1 ms              Assert.AreEqual failed. Expected:<-...
      Factorialtest_Lessthan_Seven     726 ms            Assert.AreEqual failed. Expected:<1...
      Factorialtest_Lessthan_Zero      1 ms              Assert.AreEqual failed. Expected:<-...
      FactorialTest_Zero_Input         2 ms              Assert.AreEqual failed. Expected:<1...
```

Group Summary
MathsTests
Tests in group: 4
Total Duration: 73
Outcomes
4 Failed

No issues found

Ln: 12 Ch: 27

Tests passed:



```
Test Explorer
4  4  0
Search Test Explorer (Ctrl+E)

Test                                   Duration   Traits   Error Message
◢ MathsTests (4)                         15 ms
  ◢ Maths.Tests (4)                      15 ms
    ◢ AlgebraTests (4)                   15 ms
        Factorialtest_Greaterthan_seven  < 1 ms
        Factorialtest_Lessthan_Seven     15 ms
        Factorialtest_Lessthan_Zero      < 1 ms
        FactorialTest_Zero_Input         < 1 ms

Group Summary
  MathsTests
    Tests in group : 4
    Total Duration : 15
  Outcomes
    4 Passed

No issues found
```

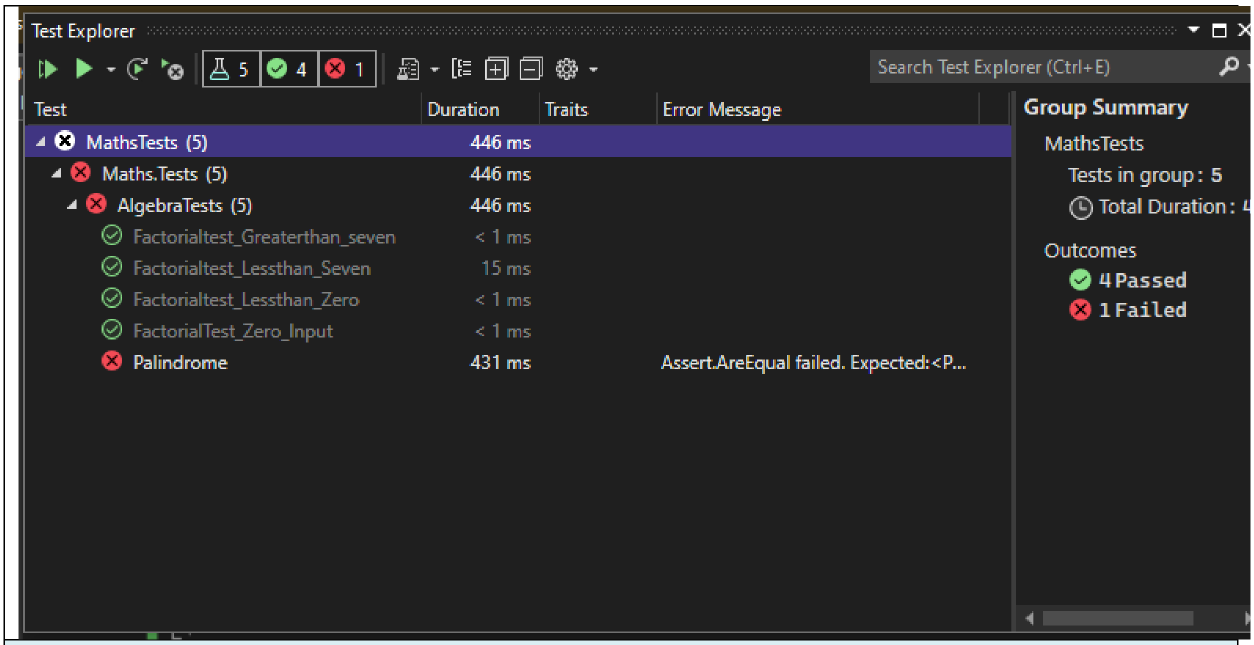
Question8:
Add one more method to check if the number is Palindrome or not in the above Algebra class and write test case for the same?

Code:

```
using Microsoft.VisualStudio.TestTools.UnitTesting;
using Maths;
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Maths.Tests
{
    [TestClass()]
    public class AlgebraTests
    {
        [TestMethod()]
        public void FactorialTest_Zero_Input()
        {
            //Arrange
            int n = 0;
            int expected = 1;

            //Act
            int actual=Algebra.Factorial(n);

            //Assert
            Assert.AreEqual(expected, actual);
        }
        [TestMethod()]
        public void Factorialtest_Greaterthan_seven()
        {
            //Arrange
            int n = 8;
            int expected = -999;

            //Act
            int actual = Algebra.Factorial(n);

            //Assert
            Assert.AreEqual(expected, actual);

        }
        [TestMethod()]
        public void Factorialtest_Lessthan_Zero()
        {
            //Arrange
            int n = -2;
            int expected = -9999;

            //Act
            int actual=Algebra.Factorial(n);

            //Assert
            Assert.AreEqual(expected, actual);
        }
        [TestMethod()]
        public void Factorialtest_Lessthan_Seven()
        {
            //Arrange
            int n = 5;
            int expected = 120;

            //Act
            int actual = Algebra.Factorial(n);

            //Assert
            Assert.AreEqual(expected, actual);

        }
        [TestMethod()]
        public void Palindrometest()
        {
            //Arrange
            int n = 363;
            string expected = "Palindrome";

            //Act
            string actual=Algebra.Palindrome(n);

            //Assert
            Assert.AreEqual(expected, actual);
        }
        [TestMethod()]
        public void Not_Palindrometest()
        {
            //Arrange
            int n = 123;
            string expected = "Not Palindrome";

            //Act
            string actual = Algebra.Palindrome(n);

            //Assert
            Assert.AreEqual(expected,actual);
        }

    }
}
```

Method:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Maths
{
    public  class Algebra
    {

        public static int Factorial(int n)
        {
            if (n == 0)
            {
                return 1;
            }
            else if (n > 7)
            {
                return -999;
            }
            else if (n < 0)
            {
                return -9999;
            }
            else
            {
                int fact = 1;
                for (int i = 1; i <= n; i++)

                    fact = fact * i;
                return fact;

            }

        }
        public static string Palindrome(int n)
        {
            int m, rem, rev = 0;
            m =n ;
            while (m > 0)
            {
                rem = m % 10;
                rev = (rev * 10) + rem;
                m = m / 10;
            }
            if (n == rev)
                return "Palindrome";
            else
                return "Not Palindrome";

        }

    }
}
```



Test Explorer

Search Test Explorer (Ctrl+E)

5 4 1

```
Test                                   Duration   Traits   Error Message
MathsTests (5)                          446 ms
  Maths.Tests (5)                       446 ms
    AlgebraTests (5)                    446 ms
      Factorialtest_Greaterthan_seven   < 1 ms
      Factorialtest_Lessthan_Seven       15 ms
      Factorialtest_Lessthan_Zero       < 1 ms
      FactorialTest_Zero_Input          < 1 ms
      Palindrome                        431 ms            Assert.AreEqual failed. Expected:<P...
```

Group Summary

MathsTests

Tests in group: 5

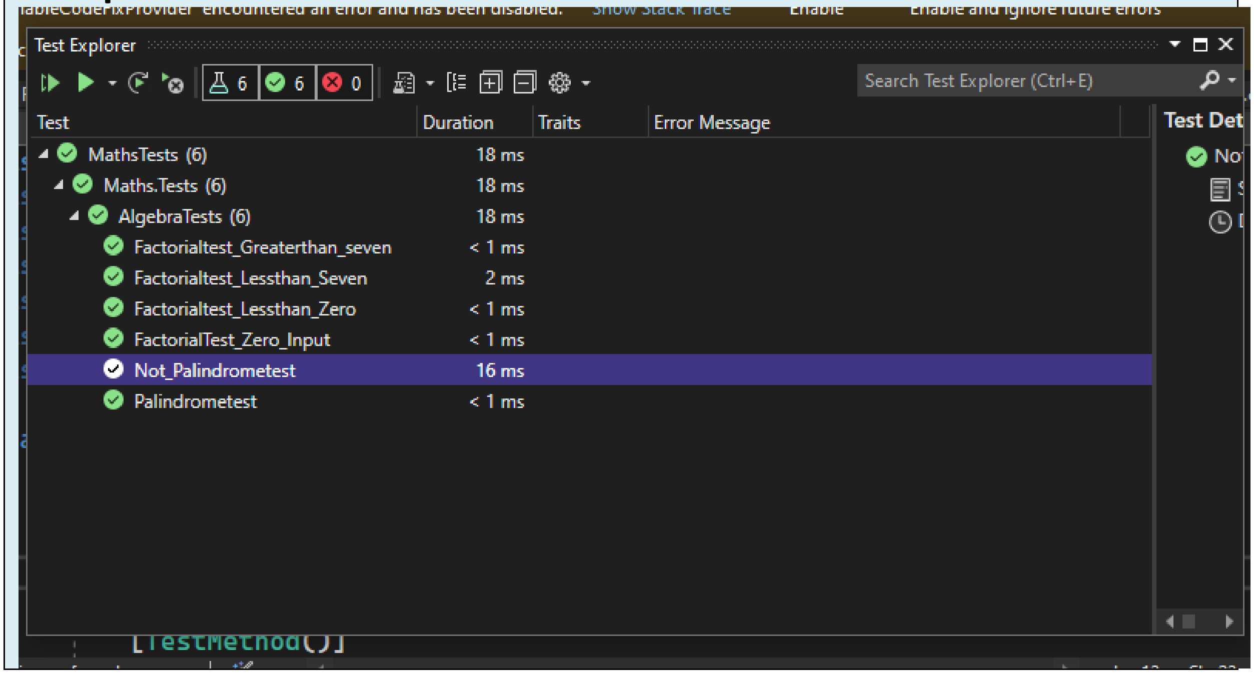
Total Duration:

Outcomes

4 Passed

1 Failed

Test passed:



Test Explorer

Search Test Explorer (Ctrl+E)

6 6 0

```
Test                                   Duration   Traits   Error Message
MathsTests (6)                           18 ms
  Maths.Tests (6)                        18 ms
    AlgebraTests (6)                     18 ms
      Factorialtest_Greaterthan_seven   < 1 ms
      Factorialtest_Lessthan_Seven        2 ms
      Factorialtest_Lessthan_Zero       < 1 ms
      FactorialTest_Zero_Input          < 1 ms
      Not_Palindrometest                 16 ms
      Palindrometest                    < 1 ms
```

Test Det

[TestMethod()]