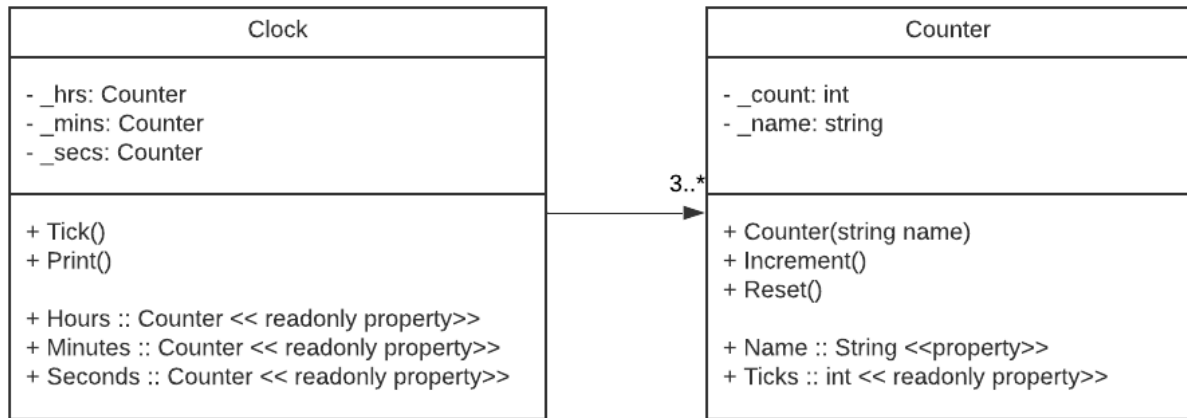


SWINBURNE UNIVERSITY OF TECHNOLOGY

COS20007 OBJECT ORIENTED PROGRAMMING

3.1P - Clock Class

PDF generated at 22:29 on Sunday 12th March, 2023



```
1 namespace ClockClass
2 {
3     class MainClass
4     {
5         public static void Main(string[] args)
6         {
7             Clock myClock = new Clock();
8
9             for (int i = 0; i < 10000; i++)
10            {
11                myClock.Tick();
12            }
13            myClock.Print();
14        }
15    }
16 }
```

```
1  using System;
2  using System.Collections.Generic;
3  using System.Linq;
4  using System.Text;
5  using System.Threading.Tasks;
6
7  namespace ClockClass
8  {
9      public class Clock
10     {
11         Counter _hrs = new Counter("hrs");
12         Counter _mins = new Counter("mins");
13         Counter _secs = new Counter("secs");
14
15         public Counter Hours
16         {
17             get
18             {
19                 return _hrs;
20             }
21         }
22         public Counter Minutes
23         {
24             get
25             {
26                 return _mins;
27             }
28         }
29         public Counter Seconds
30         {
31             get
32             {
33                 return _secs;
34             }
35         }
36
37         public void Tick()
38         {
39             if (_secs.Ticks <= 58)
40             {
41                 _secs.Increment();
42             }
43             else if (_mins.Ticks <= 58)
44             {
45                 _mins.Increment();
46
47                 _secs.Reset();
48             }
49             else if (_hrs.Ticks <= 22)
50             {
51                 _hrs.Increment();
52
53                 _mins.Reset();
```

```
54         _secs.Reset();
55     }
56     else
57     {
58         _hrs.Reset();
59         _mins.Reset();
60         _secs.Reset();
61     }
62 }
63
64 public void Print()
65 {
66     Console.WriteLine("{0}:{1}:{2}", _hrs.Ticks.ToString("00"),
↪ _mins.Ticks.ToString("00"), _secs.Ticks.ToString("00"));
67 }
68 }
69 }
```

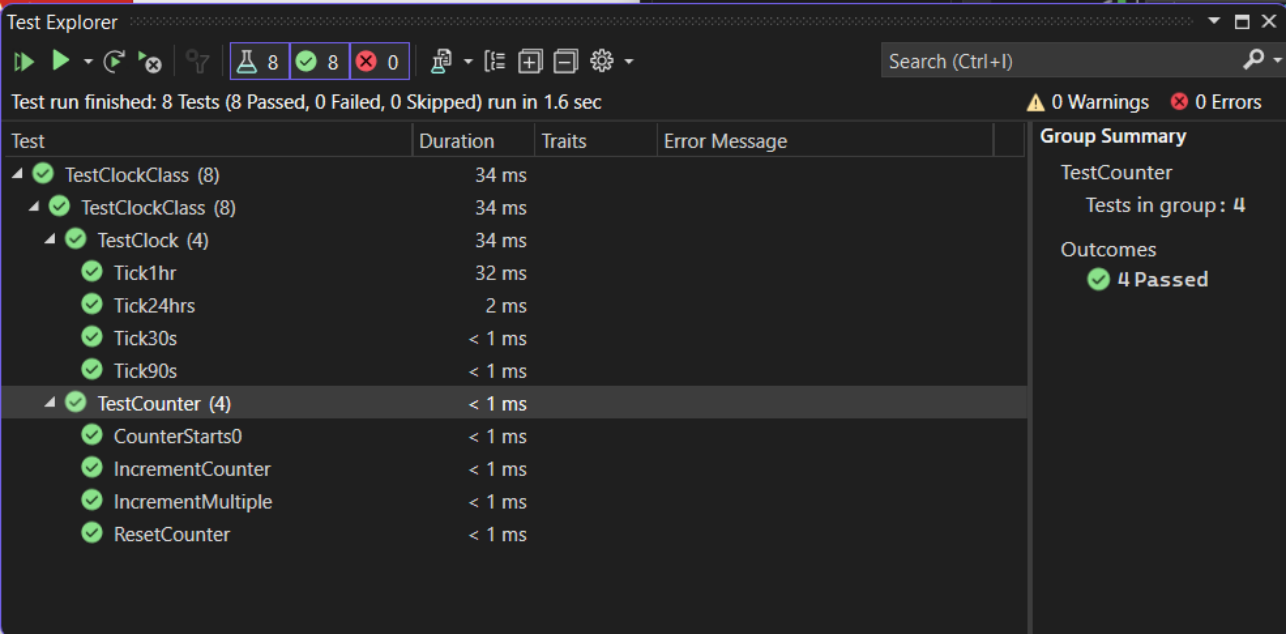
```
1
2 using NUnit.Framework;
3
4 namespace TestClockClass
5 {
6     public class TestClock
7     {
8         Clock myClock;
9         [SetUp]
10        public void Setup()
11        {
12            myClock = new Clock();
13        }
14
15
16        [Test]
17        public void Tick30s()
18        {
19            for (int i = 0; i < 30; i++)
20            {
21                myClock.Tick();
22            }
23            Assert.That(myClock.Seconds.Ticks, Is.EqualTo(30));
24            Assert.That(myClock.Minutes.Ticks, Is.EqualTo(0));
25            Assert.That(myClock.Hours.Ticks, Is.EqualTo(0));
26        }
27
28        [Test]
29        public void Tick90s()
30        {
31            for (int i = 0; i < 90; i++)
32            {
33                myClock.Tick();
34            }
35            Assert.That(myClock.Seconds.Ticks, Is.EqualTo(30));
36            Assert.That(myClock.Minutes.Ticks, Is.EqualTo(1));
37            Assert.That(myClock.Hours.Ticks, Is.EqualTo(0));
38        }
39
40        [Test]
41        public void Tick1hr()
42        {
43            for (int i = 0; i < 3600; i++)
44            {
45                myClock.Tick();
46            }
47            Assert.That(myClock.Seconds.Ticks, Is.EqualTo(0));
48            Assert.That(myClock.Minutes.Ticks, Is.EqualTo(0));
49            Assert.That(myClock.Hours.Ticks, Is.EqualTo(1));
50        }
51
52        [Test]
53        public void Tick24hrs()
```

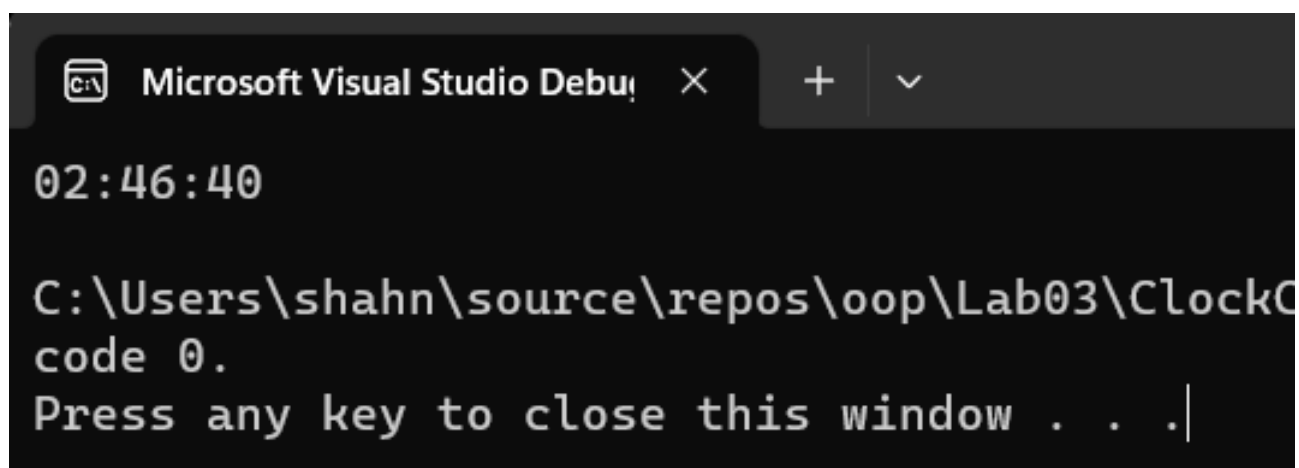
```
54     {
55         for (int i = 0; i < 86400; i++)
56         {
57             myClock.Tick();
58         }
59         Assert.That(myClock.Seconds.Ticks, Is.EqualTo(0));
60         Assert.That(myClock.Minutes.Ticks, Is.EqualTo(0));
61         Assert.That(myClock.Hours.Ticks, Is.EqualTo(0));
62     }
63
64 }
65 }
```

```
1  using System;
2  using System.Collections.Generic;
3  using System.Linq;
4  using System.Text;
5  using System.Threading.Tasks;
6
7  namespace ClockClass
8  {
9      public class Counter
10     {
11         private int _count;
12         private string _name;
13
14         public string Name
15         {
16             get
17             {
18                 return _name;
19             }
20             set
21             {
22                 _name = value;
23             }
24         }
25         public int Ticks
26         {
27             get
28             {
29                 return _count;
30             }
31         }
32
33         public Counter(string name)
34         {
35             _name = name;
36             _count = 0;
37         }
38
39         public void Increment()
40         {
41             _count++;
42         }
43
44         public void Reset()
45         {
46             _count = 0;
47         }
48     }
49 }
```



```
1 namespace TestClockClass
2 {
3     [TestFixture]
4     public class TestCounter
5     {
6         Counter myCounter;
7
8         [SetUp]
9         public void Setup()
10        {
11            myCounter = new Counter("counter");
12        }
13
14        [Test]
15        public void CounterStarts0()
16        {
17            Assert.That(myCounter.Ticks, Is.EqualTo(0));
18        }
19
20        [Test]
21        public void IncrementCounter()
22        {
23            myCounter.Increment();
24            Assert.That(myCounter.Ticks, Is.EqualTo(1));
25        }
26
27        [Test]
28        public void IncrementMultiple()
29        {
30            for (int i = 0; i < 10; i++)
31            {
32                myCounter.Increment();
33            }
34            Assert.That(myCounter.Ticks, Is.EqualTo(10));
35        }
36
37        [Test]
38        public void ResetCounter()
39        {
40            myCounter.Increment();
41            myCounter.Reset();
42
43            Assert.That(myCounter.Ticks, Is.EqualTo(0));
44        }
45    }
46
47 }
48 }
```





The screenshot shows a Visual Studio Debug Console window. The title bar at the top reads "Microsoft Visual Studio Debug Console" with a close button (X) and a dropdown menu (v). The console output is as follows:

```
02:46:40  
C:\Users\shahn\source\repos\oop\Lab03\ClockC  
code 0.  
Press any key to close this window . . .|
```