

Step 1:

Programs: Demo

```

43 ReferenceType obj3 = new ReferenceType();
44 obj3.Setx(400);
45
46 Console.WriteLine(obj1.GetX());
47 Console.WriteLine(obj2.GetX());
48 Console.WriteLine(obj3.GetX());
49
50 }
51
52 0 references
53 static void Main()
54     ValueType obj1 = new ValueType(); 51ms elapsed
55     obj1.Setx(100);
56     Test(obj1);
57     ReferenceType obj2 = new ReferenceType();
58     NewTest(obj2);
59 }
60 1 reference
61 static void Test(ValueType arg)
62 {

```

Name	Value	Type
obj1	(Demo.ValueType)	Demo.Vt
x	0	int

Name	Lang
Demo.exe!Demo.EntryPoint.Main() Line 54	C#

Autos: Locals: Watch 1

Diagnostic Tools: Diagnostics session: 0 seconds (89 ms selected)

Events: 2

Process Memory (MB): 7

CPU (% of all processors): 0

Summary: Events Memory Usage CPU Usage

Events: Show Events (2 of 2)

Memory Usage: Take Snapshot

CPU Usage

Step 2:

Programs: Demo

```

43 ReferenceType obj3 = new ReferenceType();
44 obj3.Setx(400);
45
46 Console.WriteLine(obj1.GetX());
47 Console.WriteLine(obj2.GetX());
48 Console.WriteLine(obj3.GetX());
49
50 }
51
52 0 references
53 static void Main()
54     ValueType obj1 = new ValueType();
55     obj1.Setx(100); 51ms elapsed
56     Test(obj1);
57     ReferenceType obj2 = new ReferenceType();
58     NewTest(obj2);
59 }
60 1 reference
61 static void Test(ValueType arg)
62 {

```

Name	Value	Type
obj1	(Demo.ValueType)	Demo.Vt
x	0	int

Name	Lang
Demo.exe!Demo.EntryPoint.Main() Line 55	C#

Autos: Locals: Watch 1

Diagnostic Tools: Diagnostics session: 0 seconds (89 ms selected)

Events: 3

Process Memory (MB): 7

CPU (% of all processors): 0

Summary: Events Memory Usage CPU Usage

Events: Show Events (3 of 3)

Memory Usage: Take Snapshot

CPU Usage

Step 3:

Programs: Demo

```

22 3 references
23 public int GetX() { return this.x; }
24 #endregion
25
26
27 3 references
28 struct ValueType
29 {
30     int x;
31     2 references
32     public void Setx(int value) { this.x = value; } 51ms elapsed
33 }
34 0 references
35 class EntryPoint
36 {
37     0 references
38     static void Main_old()
39     {
40         int x = 100; //value type, method scope(stack)

```

Name	Value	Type
this	(Demo.ValueType)	Demo.Vt
x	0	int
value	100	int

Name	Lang
Demo.exe!Demo.ValueType.Setx(int value) Line 30	C#
Demo.exe!Demo.EntryPoint.Main() Line 55	C#

Autos: Locals: Watch 1

Diagnostic Tools: Diagnostics session: 0 seconds (89 ms selected)

Events: 4

Process Memory (MB): 7

CPU (% of all processors): 0

Summary: Events Memory Usage CPU Usage

Events: Show Events (4 of 4)

Memory Usage: Take Snapshot

CPU Usage

Step 4:

Visual Studio interface showing the execution of the `Setx` method. The code editor displays the `Setx` method with a breakpoint at line 30. The Autos window shows the state of the `Value` type instance, including `this`, `x`, `this.x`, and `value`. The Call Stack shows the current method `Setx` and its caller `Main`.

Name	Value	Type
this	(Demo.ValueType)	Demo.Ve
x	0	int
this.x	0	int
value	100	int

Name	Lang
Demo.exe!Demo.ValueType.Setx(int value) Line 30	C#
Demo.exe!Demo.EntryPoint.Main() Line 55	C#

Step 5:

Visual Studio interface showing the execution of the `Main` method. The code editor displays the `Main` method with a breakpoint at line 55. The Autos window shows the state of the `obj1` and `x` variables. The Call Stack shows the current method `Main` and its caller `Main`.

Name	Value	Type
obj1	(Demo.ValueType)	Demo.Ve
x	100	int

Name	Lang
Demo.exe!Demo.EntryPoint.Main() Line 55	C#

Step 6:

Visual Studio interface showing the execution of the `Main` method. The code editor displays the `Main` method with a breakpoint at line 56. The Autos window shows the state of the `obj1` and `x` variables. The Call Stack shows the current method `Main` and its caller `Main`.

Name	Value	Type
obj1	(Demo.ValueType)	Demo.Ve
x	100	int

Name	Lang
Demo.exe!Demo.EntryPoint.Main() Line 56	C#

Step 7:

Program.cs Demo Demo.EntryPoint Test(ValueType arg)

```

49
50
51
52 static void Main()
53 {
54     ValueType obj1 = new ValueType();
55     obj1.Setx(100);
56     Test(obj1);
57     ReferenceType obj2 = new ReferenceType();
58     NewTest(obj2);
59 }
60 static void Test(ValueType arg)
61 {
62     arg.Setx(300); 51ms elapsed
63 }
64 static void NewTest(ReferenceType arg)
65 {
66     arg.Setx(500);
67 }

```

Autos

Name	Value	Type
arg	(Demo.ValueType)	Demo.ValueType
x	100	int

Call Stack

Name	Language
Demo.exe!Demo.EntryPoint.Test(Demo.ValueType arg) Line 62	C#
Demo.exe!Demo.EntryPoint.Main() Line 56	C#

Diagnostic Tools

Diagnostics session: 0 seconds (91 ms selected)

Events

Process Memory (MB)

CPU (% of all processors)

Summary Events Memory Usage CPU Usage

Events

Show Events (10 of 10)

Memory Usage

Take Snapshot

CPU Usage

Step 8:

Program.cs Demo Demo.ValueType Setx(int value)

```

22
23 public int GetX() { return this.x; }
24 #endregion
25
26
27 struct ValueType
28 {
29     int x;
30     public void Setx(int value) { this.x = value; } 51ms elapsed
31 }
32
33 class EntryPoint
34 {
35     static void Main_old()
36     {
37         int x = 100; //value type, method scope(stack)
38     }
39 }

```

Autos

Name	Value	Type
this	(Demo.ValueType)	Demo.ValueType
x	100	int
value	300	int

Call Stack

Name	Language
Demo.exe!Demo.ValueType.Setx(int value) Line 30	C#
Demo.exe!Demo.EntryPoint.Test(Demo.ValueType arg) Line 62	C#
Demo.exe!Demo.EntryPoint.Main() Line 56	C#

Diagnostic Tools

Diagnostics session: 0 seconds (91 ms selected)

Events

Process Memory (MB)

CPU (% of all processors)

Summary Events Memory Usage CPU Usage

Events

Show Events (11 of 11)

Memory Usage

Take Snapshot

CPU Usage

Step 9:

Program.cs Demo Demo.ValueType Setx(int value)

```

22
23 public int GetX() { return this.x; }
24 #endregion
25
26
27 struct ValueType
28 {
29     int x;
30     public void Setx(int value) { this.x = value; } 51ms elapsed
31 }
32
33 class EntryPoint
34 {
35     static void Main_old()
36     {
37         int x = 100; //value type, method scope(stack)
38     }
39 }

```

Autos

Name	Value	Type
this	(Demo.ValueType)	Demo.ValueType
x	100	int
this.x	100	int
value	300	int

Call Stack

Name	Language
Demo.exe!Demo.ValueType.Setx(int value) Line 30	C#
Demo.exe!Demo.EntryPoint.Test(Demo.ValueType arg) Line 62	C#
Demo.exe!Demo.EntryPoint.Main() Line 56	C#

Diagnostic Tools

Diagnostics session: 0 seconds (91 ms selected)

Events

Process Memory (MB)

CPU (% of all processors)

Summary Events Memory Usage CPU Usage

Events

Show Events (12 of 12)

Memory Usage

Take Snapshot

CPU Usage

Program.cs Demo Demo.ValueType Setx(int value)

```

22
23     3 references
24     public int GetX() { return this.x; }
25     #endregion
26
27     3 references
28     struct ValueType
29     {
30         2 references
31         int x;
32         public void Setx(int value) { this.x = value; } 51ms elapsed
33     }
34     0 references
35     class EntryPoint
36     {
37         static void Main_old()
38         {
39             int x = 100; //value type, method scope(stack)
40         }
41     }

```

Autos

Name	Value	Type
this	(Demo.ValueType)	Demo.Vt
x	300	int
this.x	300	int
value	300	int

Call Stack

Name	Lang
Demo.exe\Demo.ValueType.Setx(int value) Line 30	C#
Demo.exe\Demo.EntryPoint.Test(Demo.ValueType arg) Line 62	C#
Demo.exe\Demo.EntryPoint.Main() Line 56	C#

Diagnostic Tools

Diagnostics session: 0 seconds (92 ms selected)

Events

Process Memory (MB)

CPU (% of all processors)

Summary Events Memory Usage CPU Usage

Events

Show Events (13 of 13)

Memory Usage

Take Snapshot

CPU Usage

Program.cs Demo Demo.EntryPoint Test(ValueType arg)

```

53
54     ValueType obj1 = new ValueType();
55     obj1.Setx(100);
56     Test(obj1);
57     ReferenceType obj2 = new ReferenceType();
58     NewTest(obj2);
59
60     1 reference
61     static void Test(ValueType arg)
62     {
63         arg.Setx(300); 51ms elapsed
64     }
65     1 reference
66     static void NewTest(ReferenceType arg)
67     {
68         arg.Setx(500);
69     }
70

```

Autos

Name	Value	Type
arg	(Demo.ValueType)	Demo.Vt
x	300	int

Call Stack

Name	Lang
Demo.exe\Demo.EntryPoint.Test(Demo.ValueType arg) Line 62	C#
Demo.exe\Demo.EntryPoint.Main() Line 56	C#

Diagnostic Tools

Diagnostics session: 0 seconds (92 ms selected)

Events

Process Memory (MB)

CPU (% of all processors)

Summary Events Memory Usage CPU Usage

Events

Show Events (14 of 14)

Memory Usage

Take Snapshot

CPU Usage

Step 10:

Program.cs Demo Demo.EntryPoint Main()

```

53
54     ValueType obj1 = new ValueType();
55     obj1.Setx(100);
56     Test(obj1); 52ms elapsed
57     ReferenceType obj2 = new ReferenceType();
58     NewTest(obj2);
59
60     1 reference
61     static void Test(ValueType arg)
62     {
63         arg.Setx(300);
64     }
65     1 reference
66     static void NewTest(ReferenceType arg)
67     {
68         arg.Setx(500);
69     }
70

```

Autos

Name	Value	Type
obj1	(Demo.ValueType)	Demo.Vt
x	100	int

Call Stack

Name	Lang
Demo.exe\Demo.EntryPoint.Main() Line 56	C#

Diagnostic Tools

Diagnostics session: 0 seconds (94 ms selected)

Events

Process Memory (MB)

CPU (% of all processors)

Summary Events Memory Usage CPU Usage

Events

Show Events (16 of 16)

Memory Usage

Take Snapshot

CPU Usage

Step 11:

The screenshot shows the Visual Studio IDE with the following components:

- Program.cs:** The code is at line 58, which is `NewTest(obj2);`. The code includes:

```
56 Test(obj1);
57 ReferenceType obj2 = new ReferenceType();
58 NewTest(obj2);
59
60 static void Test(ValueType arg)
61 {
62     arg.Setx(300);
63 }
64
65 static void NewTest(ReferenceType arg)
66 {
67     arg.Setx(500);
68 }
```
- Diagnostic Tools:** Shows a diagnostics session with 0 seconds (110 ms selected). The CPU usage graph shows a peak at 100%.
- Autos:** A table showing the current state of variables:

Name	Value	Type
obj2	(Demo.ReferenceType)	Demo.Rt
x	0	int
Static members		
y	0	int
- Call Stack:** Shows the current call stack with the following entries:

Name	Lang
Demo.exe!Demo.EntryPoint.Main() Line 58	C#

Step 12:

The screenshot shows the Visual Studio IDE with the following components:

- Program.cs:** The code is at line 65, which is `arg.Setx(500);`. The code includes:

```
56 Test(obj1);
57 ReferenceType obj2 = new ReferenceType();
58 NewTest(obj2);
59
60 static void Test(ValueType arg)
61 {
62     arg.Setx(300);
63 }
64
65 static void NewTest(ReferenceType arg)
66 {
67     arg.Setx(500);
68 }
```
- Diagnostic Tools:** Shows a diagnostics session with 0 seconds (111 ms selected). The CPU usage graph shows a peak at 100%.
- Autos:** A table showing the current state of variables:

Name	Value	Type
arg	(Demo.ReferenceType)	Demo.Rt
x	0	int
Static members		
y	0	int
- Call Stack:** Shows the current call stack with the following entries:

Name	Lang
Demo.exe!Demo.EntryPoint.NewTest(Demo.ReferenceType arg) Line 65	C#
Demo.exe!Demo.EntryPoint.Main() Line 58	C#

Step 13:

The screenshot shows the Visual Studio IDE with the following components:

- Program.cs:** The code is at line 66, which is `arg.Setx(500);`. The code includes:

```
56 Test(obj1);
57 ReferenceType obj2 = new ReferenceType();
58 NewTest(obj2);
59
60 static void Test(ValueType arg)
61 {
62     arg.Setx(300);
63 }
64
65 static void NewTest(ReferenceType arg)
66 {
67     arg.Setx(500);
68 }
```
- Diagnostic Tools:** Shows a diagnostics session with 0 seconds (111 ms selected). The CPU usage graph shows a peak at 100%.
- Autos:** A table showing the current state of variables:

Name	Value	Type
arg	(Demo.ReferenceType)	Demo.Rt
x	0	int
Static members		
y	0	int
- Call Stack:** Shows the current call stack with the following entries:

Name	Lang
Demo.exe!Demo.EntryPoint.NewTest(Demo.ReferenceType arg) Line 66	C#
Demo.exe!Demo.EntryPoint.Main() Line 58	C#