

# CS202: Software Tools and Techniques for CSE

## Lecture 11

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August 2025

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
ConsoleApp1 Program.cs
using System.Reflection.Metadata.Ecma335;
class Program //this is a class
{
    public int data; //this is NOT common (accessible) to all objects
    public void excess32() //this is method
    {
        data += 32;
    }
    static void Main() //this is a method in the class
    {
        Console.WriteLine("Hello, World!"); //this is a statement in the method Main()
        Program program1 = new Program();
        Program program2 = new Program();
        Program program3 = new Program();
        program1.data = 1;
        program2.data = 2;
        program3.data = 3;
        program1.excess32();
        program2.excess32();
        program3.excess32();
        Console.WriteLine((program1.data)++);
        Console.WriteLine(++(program2.data));
        Console.WriteLine(program3.data);
    }
}
```

110 %

No issues found

Output

Show output from: Build

```
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 21:33 and took 00.913 seconds =====
```

Solution Explorer

Search Solution Explorer (Ctrl+Shift+F)

Solution 'ConsoleApp1' (1 of 1 project)

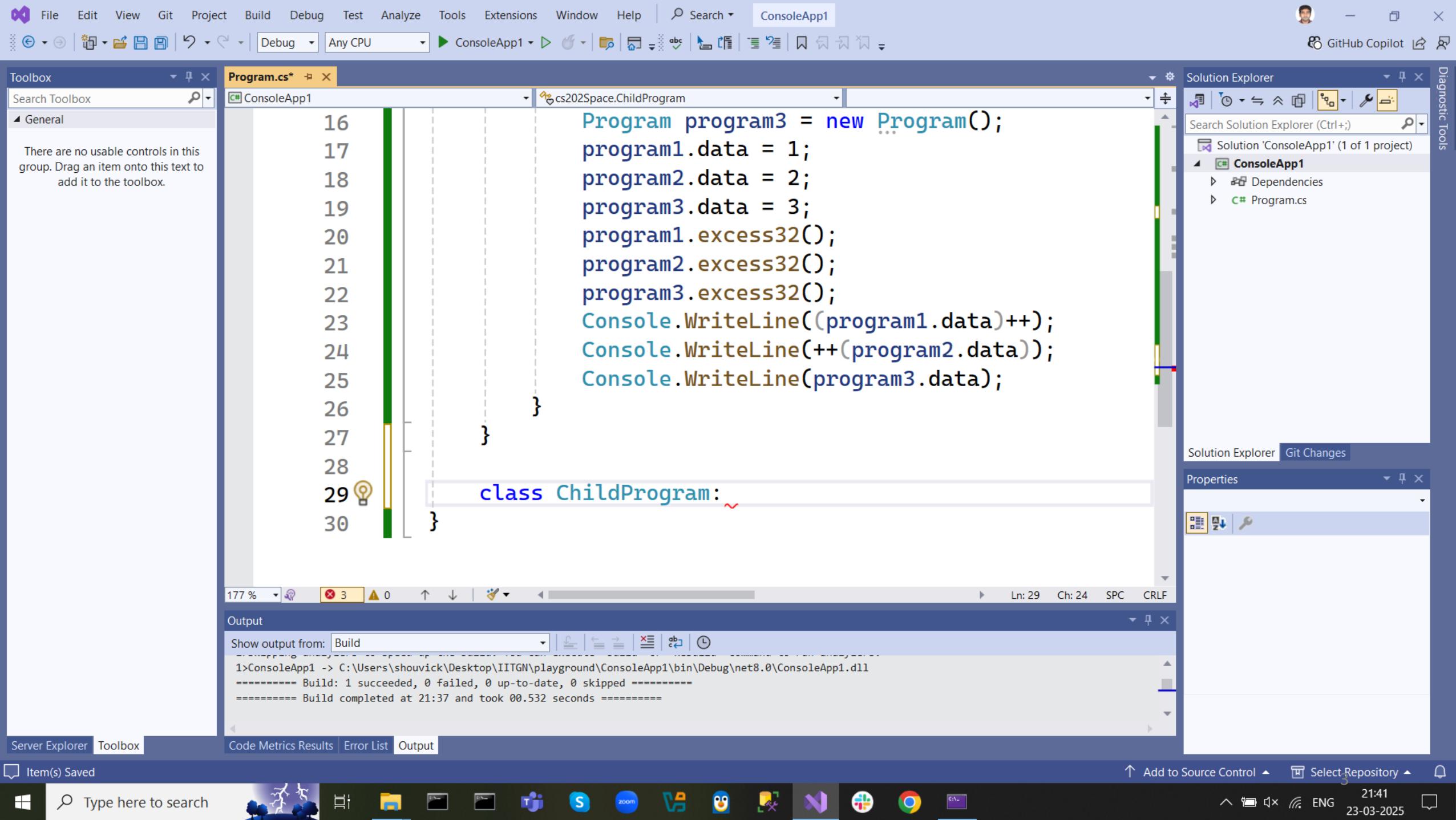
ConsoleApp1

Dependencies

C# Program.cs

Microsoft Visual Studio Debug Console

```
Hello, World!
33
35
35
C:\Users\shouwick\Desktop\IITGN\playground
0 (0x0).
Press any key to close this window . . .
```





GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs\* □ x

ConsoleApp1 cs202\_space.Program data

```
1 namespace cs202_space;
2 class Program // IDE0130: Namespace "cs202_space"
3 {
4     public int data;
5     public void Main()
6     {
7         data += 1;
8     }
9
10 static void Main() //this is a method in the class
11 {
12     Console.WriteLine("Hello, World!"); //this is a string
13     Program program1 = new Program();
14     Program program2 = new Program();
15     Program program3 = new Program();
16     program1.data = 1;
17     program2.data = 2;
```

177 % No issues found

Output

Show output from: Build

```
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 21:37 and took 00.532 seconds =====
```

Solution Explorer

Search Solution Explorer (Ctrl+Shift+F)

Solution 'ConsoleApp1' (1 of 1 project)

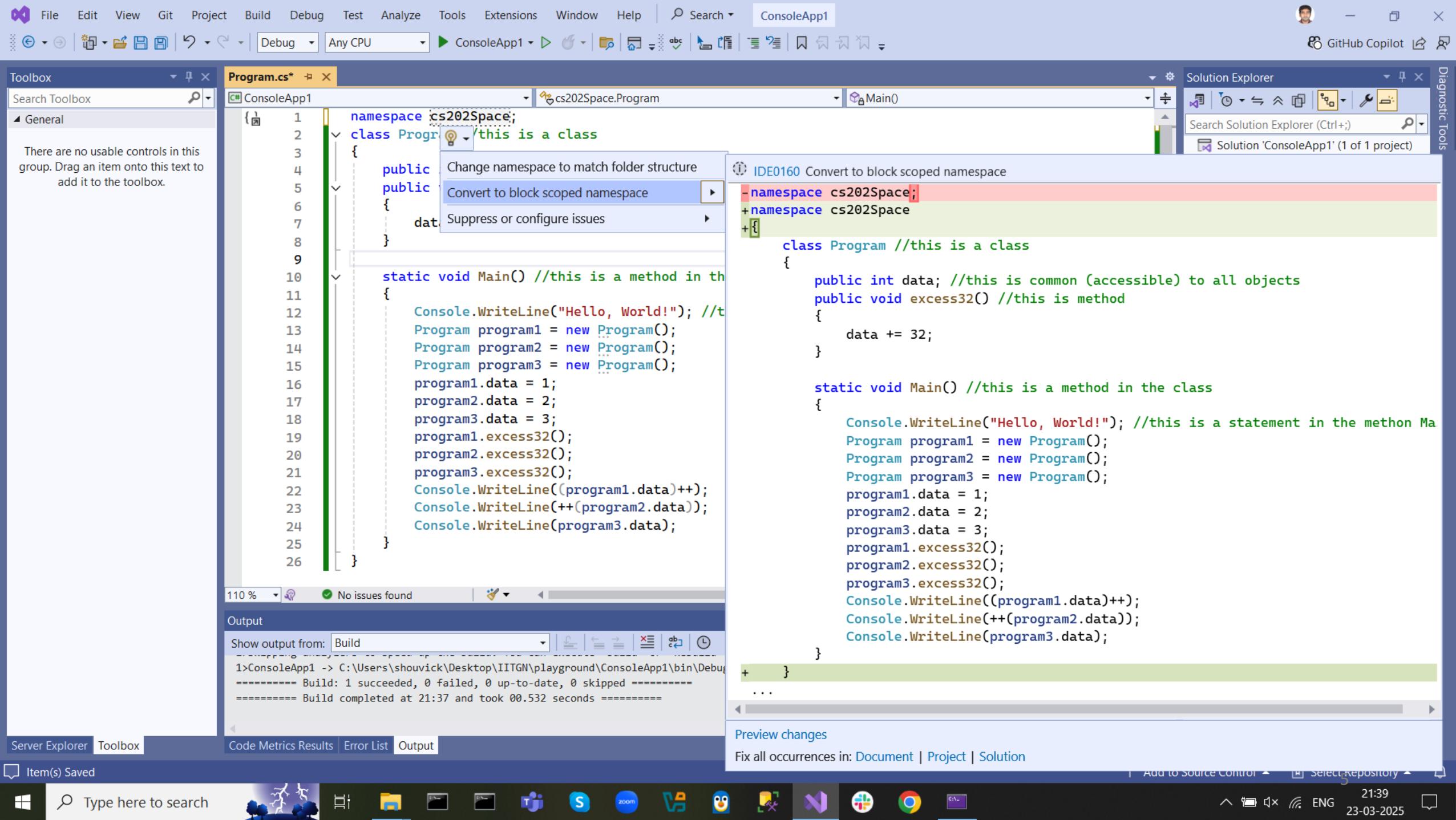
ConsoleApp1

Dependencies

Program.cs

Solution Explorer Git Changes

Properties





GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs\* □ x

ConsoleApp1 cs202Space.cs Main()

```
namespace cs202Space
{
    class Program //this is a class
    {
        public int data; //this is common (accessible) to all objects
        public void excess32() //this is method
        {
            data += 32;
        }

        static void Main() //this is a method in the class
        {
            Console.WriteLine("void Program.Main()"); //this is a statement in the methon Main()
            Program program1 = new Program();
            Program program2 = new Program();
            Program program3 = new Program();
            program1.data = 1;
            program2.data = 2;
            program3.data = 3;
            program1.excess32();
            program2.excess32();
            program3.excess32();
            Console.WriteLine((program1.data)++);
            Console.WriteLine(++(program2.data));
            Console.WriteLine(program3.data);
        }
    }
}
```

110 % No issues found

Solution Explorer

Search Solution Explorer (Ctrl+Shift+F)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

C# Program.cs

Solution Explorer Git Changes

Properties



GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs\* □ x

ConsoleApp1 cs202Space.cs excess32()

```
namespace cs202Space
{
    class Program //this is a class
    {
        public int data; //this is common (accessible) to all objects
        public void excess32() //this is method
        {
            data += 32;
        }

        static void fun() //this is a method in the class
        {
            Console.WriteLine("Hello, World!");
        }
    }

    static void Main(string[] args)
    {
        Program p = new Program();
        p.excess32();
        fun();
        Program p1 = new Program();
        p1.excess32();
        Program p2 = new Program();
        p2.excess32();
        Program p3 = new Program();
        p3.excess32();
    }
}
```

133 % 3 0 Ln: 8 Ch: 24 SPC CRLF

Output

Show output from: Build

```
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 21:37 and took 00.532 seconds =====
```

Solution Explorer

Search Solution Explorer (Ctrl+Shift+F)

Solution 'ConsoleApp1' (1 of 1 project)

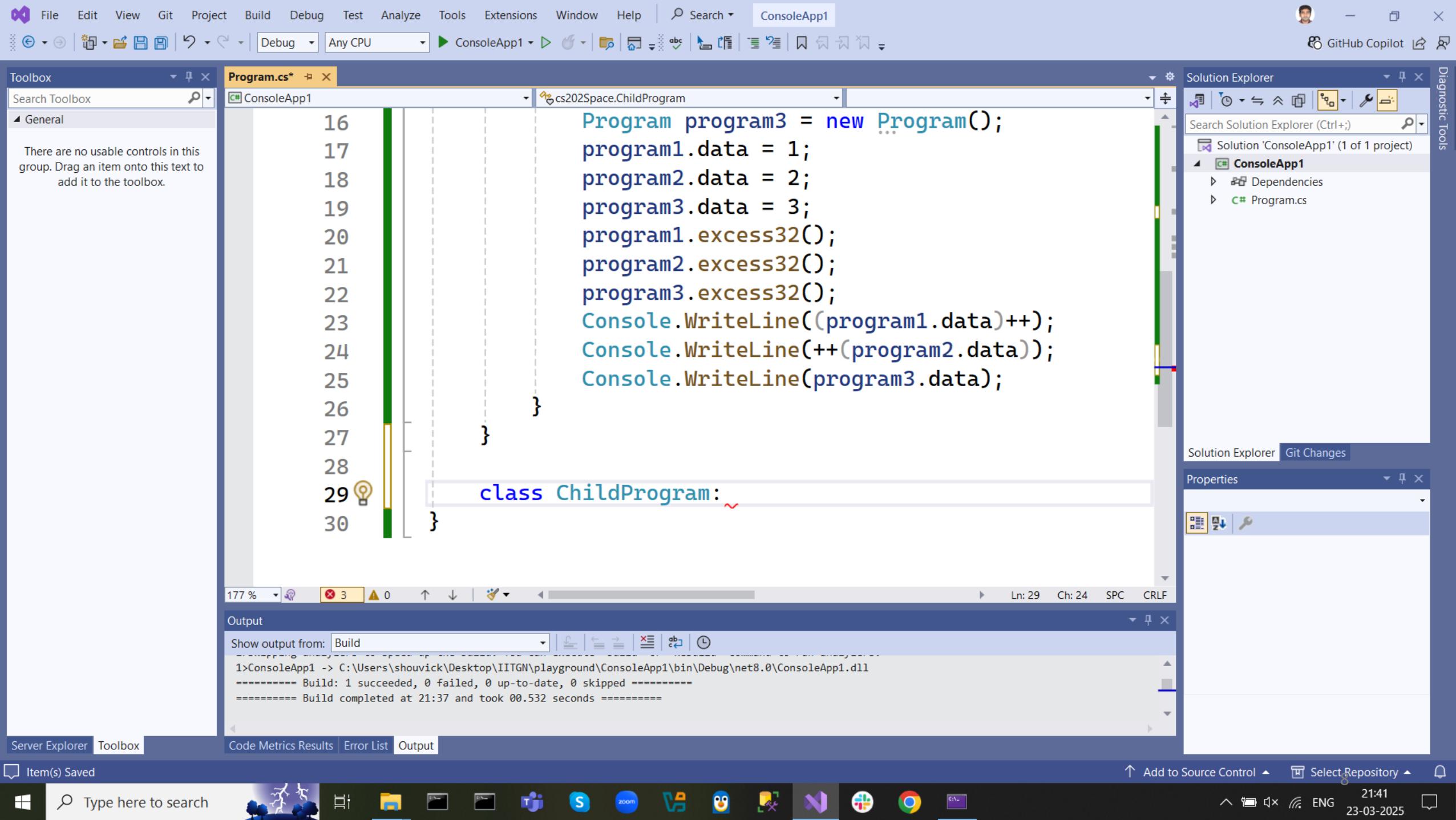
ConsoleApp1

Dependencies

C# Program.cs

Solution Explorer Git Changes

Properties





GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs\*

ConsoleApp1.cs20Space.ChildProgram Main()

```
namespace cs20Space
{
    class Program //this is a class
    {
        public int data; //this is common (accessible) to all objects
        public void excess32() //this is method...
        public void fun() //this is a method in the class...
    }

    class ChildProgram:Program //inherits base class Program
    {
        static void Main()
        {
    }
}
```

133 % No issues found

Output

Show output from: Build

```
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 21:37 and took 00.532 seconds =====
```

Solution Explorer

Search Solution Explorer (Ctrl+Shift+F)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

C# Program.cs

Solution Explorer Git Changes

Properties



GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs\*

```
ConsoleApp1.cs202Space.cs202Space.csMain()
```

1 namespace cs202Space  
2 {  
3 class Program //this is a class  
4 {  
5 public int data; //this is common (accessible) to all objects  
6 public void excess32() //this is method...  
7 public void fun() //this is a method in the class...  
8 }  
9  
10 class ChildProgram:Program //inherits base class Program  
11 {  
12 static void Main()  
13 {  
14 ChildProgram son = new ChildProgram();  
15 son.  
16 childProgram.  
17 child.  
18 program.  
19 + [ ] [ ]  
20 }  
21 }  
22  
23 }  
24  
25 }

133% 1 1 Ln: 32 Ch: 29 SPC CRLF

Output

Show output from: Build

```
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.dll  
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped ======
```

Solution Explorer

Search Solution Explorer (Ctrl+Shift+F)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

C# Program.cs

Solution Explorer Git Changes

Properties



GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs\*

```
ConsoleApp1.cs20Space.ChildProgramMain()
1  namespace cs20Space
2  {
3      class Program //this is a class
4      {
5          public int data; //this is common (accessible) to all objects
6          public void excess32() //this is method...
7          public void fun() //this is a method in the class...
8      }
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28     class ChildProgram:Program //inherits base class Program
29     {
30         static void Main()
31         {
32             ChildProgram son = new ChildProgram();
33         }
34     }
35
36 }
```

Solution Explorer

Search Solution Explorer (Ctrl+Shift+F)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

- Dependencies
- Program.cs

Properties



GitHub Copilot

Toolbox  X

Search Toolbox  X

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs\*  X

C# ConsoleApp1 cs202Space.ChildProgram Main()

```
namespace cs202Space
{
    class Program //this is a class
    {
        public int data; //this is common (accessible) to all objects
        public void excess32() //this is method...
        public void fun() //this is a method in the class...
    }

    class ChildProgram: Program //inherits base class Program
    {
        static void Main()
        {
            ChildProgram ramesh = new ChildProgram();
            ChildProgram suresh = new ChildProgram();
            ramesh.fun();
            suresh.fun();

            suresh.excess32();

            ramesh.fun();
            suresh.fun();
        }
    }
}
```

121%  No issues found          Ln: 39 Ch: 26 OVR SPC CRLF

Solution Explorer  X

Search Solution Explorer (Ctrl+Shift+F)

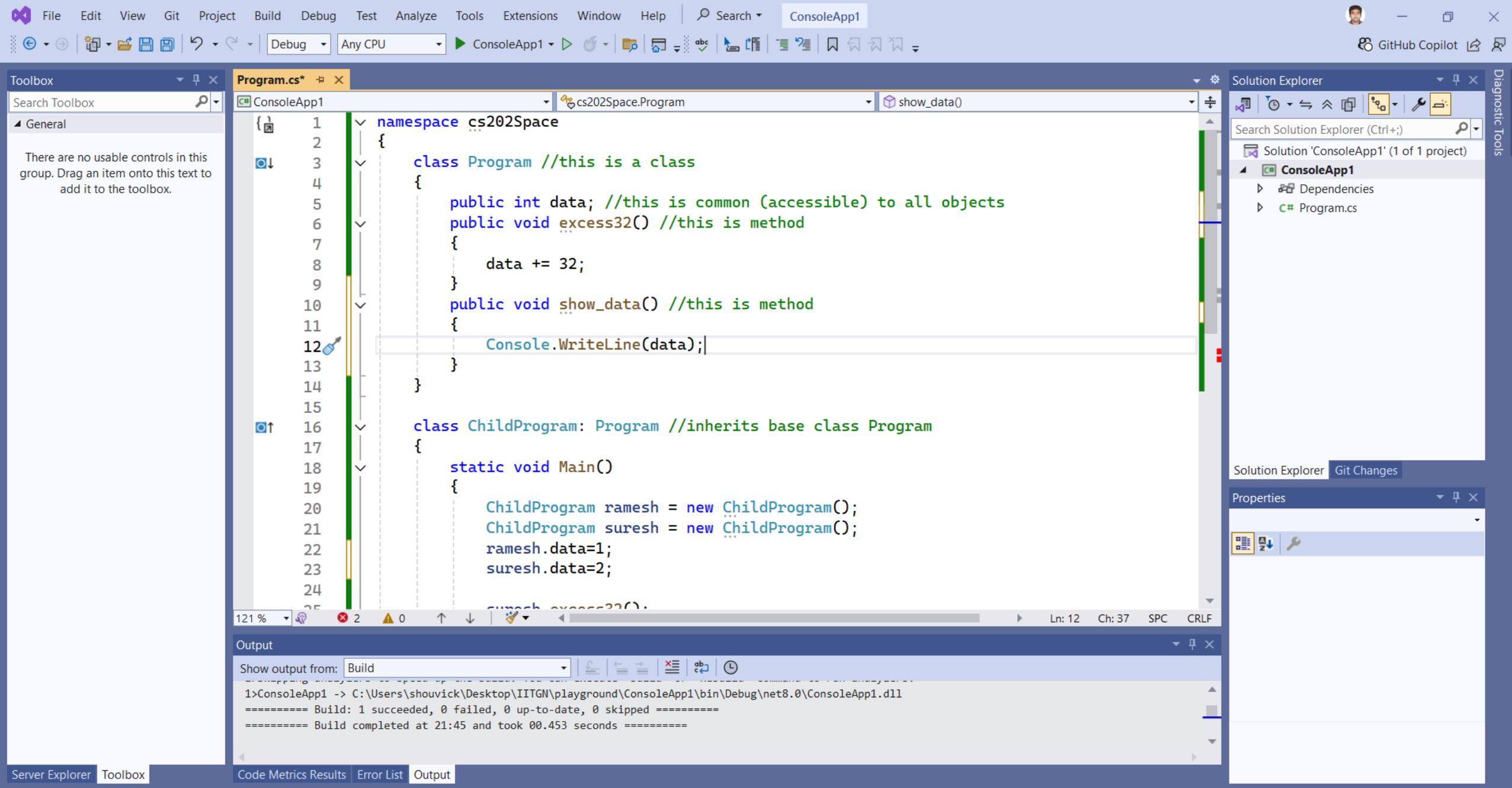
Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

- Dependencies
- Program.cs

Solution Explorer  X

Properties  X





## Toolbox

## Search Toolbox

## General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

```
ConsoleApp1.cs202Space.Program.cs data
1  namespace cs202Space
2  {
3      class Program //this is a class
4      {
5          public int data; //this is common (accessible) to all objects
6          public void excess32() //this is method...
7          public void show_data() //this is method...
8      }
9
10     class ChildProgram: Program //inherits base class Program
11     {
12         static void Main()
13         {
14             ChildProgram ramesh = new ChildProgram();
15             ChildProgram suresh = new ChildProgram();
16             ramesh.data=1;
17             suresh.data=2;
18
19             suresh.excess32();
20
21             ramesh.show_data();
22             suresh.show_data();
23         }
24     }
25 }
```

121 %

No issues found

Ln: 1 Ch: 1 SPC CRLF

Output

Show output from: Build

```
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 03:23 and took 00.448 seconds =====
```

## Server Explorer

## Toolbox

## Error List

## Output

↑ Add to Source Control ▾ Select Repository ▾

14 03:25  
24-03-2025

Type here to search



Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
ConsoleApp1.cs202Space.Program.cs data
```

```
namespace cs202Space
{
    class Program //this is a class
    {
        public int data; //this is common (accessible) to all objects
        public void excess32() //this is method...
        public void show_data() //this is method...
    }

    class ChildProgram: Program //inherits base class Program
    {
        static void Main()
        {
            ChildProgram ramesh = new ChildProgram();
            ChildProgram suresh = new ChildProgram();
            ramesh.data=1;
            suresh.data=2;

            suresh.excess32();

            ramesh.show_data();
            suresh.show_data();
        }
    }
}
```

121 % No issues found

Output

```
Show output from: Build
```

```
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 03:25 and took 00.416 seconds =====
```

Microsoft Visual Studio Debug Console

```
1
34
C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.
0 (0x0).
Press any key to close this window
```

Server Explorer

Error List

Output

Build succeeded



Type here to search





## Toolbox

## Search Toolbox

## General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

```
ConsoleApp1.cs202Space.ChildProgram.Main()
1  namespace cs202Space
2  {
3      class Program //this is a class
4      {
5          public int data; //this is common (accessible) to all objects
6          public void excess32() //this is method...
7          public void show_data() //this is method...
8      }
9
10     class ChildProgram: Program //inherits base class Program
11     {
12         static void Main()
13         {
14             Program ramesh = new ChildProgram();
15             Program suresh = new ChildProgram();
16             ramesh.data=1;
17             suresh.data=2;
18
19             suresh.excess32();
20
21             ramesh.show_data();
22             suresh.show_data();
23         }
24     }
25
26
27
28
29
30 }
```

121% No issues found

## Output

Show output from: Build

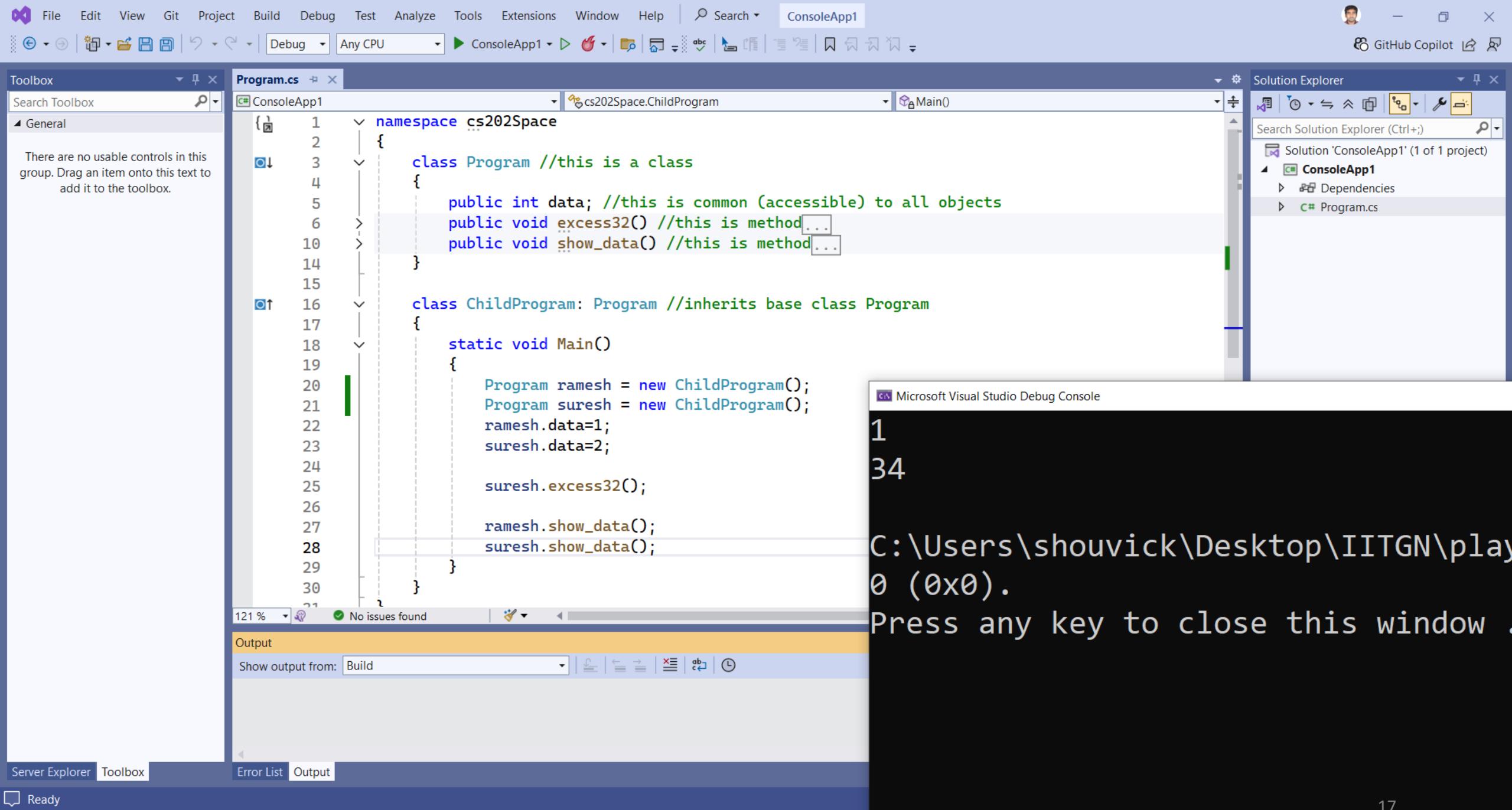
## Solution Explorer

Search Solution Explorer (Ctrl+;) Solution 'ConsoleApp1' (1 of 1 project)  
ConsoleApp1  
Dependencies  
Program.cs

Solution Explorer Git Changes

Properties





Toolbox ▾ X

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs\* ▾ X

ConsoleApp1 cs202Space.ChildProgram Main()

```
namespace cs202Space
{
    class Program //this is a class
    {
        public int data; //this is common (accessible) to all objects
        public void excess32() //this is method...
        public void show_data() //this is method...
    }

    class ChildProgram: Program //inherits base class Program
    {
        static void Main()
        {
            Program ramesh = new Program();
            Program suresh = new Program();
            ramesh.data=1;
            suresh.data=2;

            suresh.excess32();

            ramesh.show_data();
            suresh.show_data();
        }
    }
}
```

121% No issues found

Output

Show output from: Build

Solution Explorer

Search Solution Explorer (Ctrl+;) ▾

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

Program.cs

Properties

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
ConsoleApp1.cs202Space.ChildProgramMain()
1 namespace cs202Space
2 {
3     class Program //this is a class
4     {
5         public int data; //this is common (accessible) to all objects
6         public void excess32() //this is method...
7         public void show_data() //this is method...
8     }
9
10    class ChildProgram: Program //inherits base class Program
11    {
12        static void Main()
13        {
14            Program ramesh = new Program();
15            Program suresh = new Program();
16            ramesh.data=1;
17            suresh.data=2;
18
19            suresh.excess32();
20
21            ramesh.show_data();
22            suresh.show_data();
23        }
24    }
25
26
27
28
29
30 }
```

121 % No issues found

Output

```
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.exe
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 03:29 and took 00.484 seconds =====
```

Solution Explorer

Search Solution Explorer (Ctrl+;) Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
  - Dependencies
  - Program.cs

Microsoft Visual Studio Debug Console

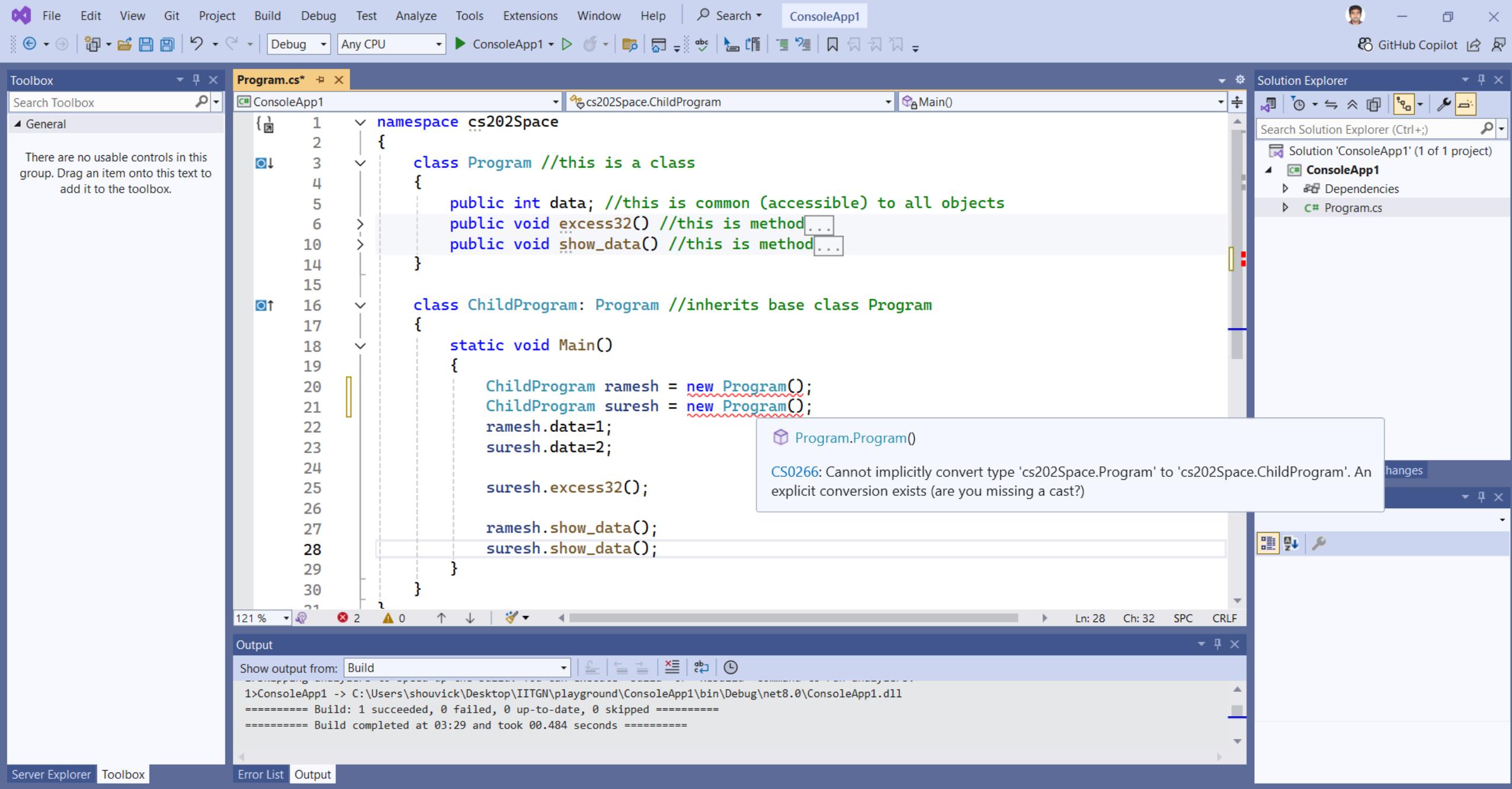
```
1
34
C:\Users\shouwick\Desktop\IITGN\play
0 (0x0).
Press any key to close this window .
```

Server Explorer

Error List

Output

Build succeeded



The screenshot shows the Microsoft Visual Studio IDE interface with the following details:

- Top Bar:** File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help, Search (ConsoleApp1).
- Solution Explorer:** Shows Solution 'ConsoleApp1' (1 of 1 project) with files ConsoleApp1.cs, Dependencies, and Program.cs.
- Toolbox:** General group, note: There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.
- Code Editor (Program.cs):** Displays C# code for a console application. A context menu is open at line 21, showing options: "Rename 'Program' to 'ChildProgram'" and "Preview changes".

```
...  
- class Program //this is a class  
+ class ChildProgram //this is a class  
{  
    ...  
-     class ChildProgram: Program //inherits base class Program  
+     class ChildProgram: ChildProgram //inherits base class Program  
    {  
        static void Main()  
        {  
            ChildProgram ramesh = new Program();  
            ChildProgram suresh = new Program();  
            ChildProgram ramesh = new ChildProgram();  
            ChildProgram suresh = new ChildProgram();  
            ramesh.data=1;  
            ...  
        }  
        suresh.excess32();  
        ramesh.show_data();  
        suresh.show_data();  
    }  
}
```
- Output Window:** Shows build results:

```
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.dll  
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====  
===== Build completed at 03:29 and took 00.484 seconds =====
```
- Bottom Bar:** Server Explorer, Toolbox, Error List, Output, Add to Source Control, Select Repository, 03:31, ENG, 24-03-2025.



## Toolbox

## Search Toolbox

## General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs\*

```
ConsoleApp1.cs202Space.ChildProgram.Main()
1  namespace cs202Space
2  {
3      class Program //this is a class
4      {
5          public int data; //this is common (accessible) to all objects
6          public void excess32() //this is method...
7          public void show_data() //this is method...
8      }
9
10     class ChildProgram: Program //inherits base class Program
11     {
12         static void Main()
13         {
14             ChildProgram ramesh = (ChildProgram)new Program();
15             ChildProgram suresh = (ChildProgram)new Program();
16             ramesh.data=1;
17             suresh.data=2;
18
19             suresh.excess32();
20
21             ramesh.show_data();
22             suresh.show_data();
23         }
24     }
25
26
27
28
29
30 }
```

121 %

No issues found

Ln: 22 Ch: 27 SPC CRLF

Output

Show output from: Build

```
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 03:29 and took 00.484 seconds =====
```

## Server Explorer

## Toolbox

## Error List

## Output

↑ Add to Source Control ▾ Select Repository ▾

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Help Search ConsoleApp1 GitHub Copilot

Toolbox Search Toolbox General There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Build Solution Ctrl+Shift+B Rebuild Solution Clean Solution Run Code Analysis on Solution Alt+F11 Build ConsoleApp1 Ctrl+B Rebuild ConsoleApp1 Clean ConsoleApp1 Pack ConsoleApp1 Publish Selection Run Code Analysis on ConsoleApp1 Batch Build... Configuration Manager...

cs202Space.ChildProgram Main() s is a class ; //this is common (accessible) to all objects excess32() //this is method... show\_data() //this is method...

16 17 { 18 static void Main() 19 { 20 ChildProgram ramesh = (ChildProgram)new Program(); 21 ChildProgram suresh = (ChildProgram)new Program(); 22 ramesh.data=1; 23 suresh.data=2; 24 25 suresh.excess32(); 26 27 ramesh.show\_data(); 28 suresh.show\_data(); 29 } 30 }

121% No issues found Ln: 22 Ch: 27 SPC CRLF

Output Show output from: Build  
1>----- Clean started: Project: ConsoleApp1, Configuration: Debug Any CPU -----  
===== Clean: 1 succeeded, 0 failed, 0 skipped =====  
===== Clean completed at 03:32 and took 00.164 seconds =====

Server Explorer Toolbox Error List Output Clean succeeded Add to Source Control Select Repository 23 03:32 24-03-2025

Type here to search

Solution Explorer Search Solution Explorer (Ctrl+;) Solution 'ConsoleApp1' (1 of 1 project) ConsoleApp1 Dependencies Program.cs

Properties



## Toolbox

## Search Toolbox

## General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

```
ConsoleApp1.cs202Space.ChildProgram.Main()
1  namespace cs202Space
2  {
3      class Program //this is a class
4      {
5          public int data; //this is common (accessible) to all objects
6          public void excess32() //this is method...
7          public void show_data() //this is method...
8      }
9
10     class ChildProgram: Program //inherits base class Program
11     {
12         static void Main()
13         {
14             ChildProgram ramesh = (ChildProgram)new Program();
15             ChildProgram suresh = (ChildProgram)new Program();
16             ramesh.data=1;
17             suresh.data=2;
18
19             suresh.excess32();
20
21             ramesh.show_data();
22             suresh.show_data();
23         }
24     }
25
26
27
28
29
30 }
```

121 %

No issues found

Ln: 22 Ch: 27 SPC CRLF

Output

Show output from: Build

```
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 03:32 and took 00.766 seconds =====
```

## Server Explorer

## Toolbox

## Error List

## Output

Build succeeded

Add to Source Control Select Repository

24

03:32

24-03-2025

## Solution Explorer

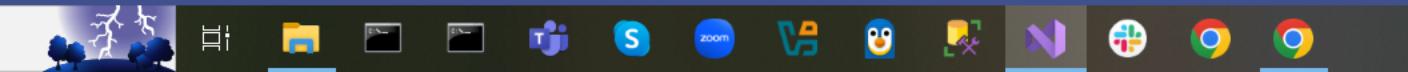
Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
  - Dependencies
  - Program.cs

## Solution Explorer

Properties



Type here to search



GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
ConsoleApp1.cs202Space.ChildProgramMain()
1  namespace cs202Space
2  {
3      class Program //this is a class
4      {
5          public int data; //this is common (accessible) to all objects
6          public void excess32() //this is method...
7          public void show_data() //this is method...
8      }
9
10     class ChildProgram: Program //inherits base class Program
11     {
12         static void Main()
13         {
14             ChildProgram ramesh = (ChildProgram)new Program();
15             ChildProgram suresh = (ChildProgram)new Program();
16         }
17     }
18 }
19
20
21 
```

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
  - Dependencies
  - Program.cs

Microsoft Visual Studio Debug Console

```
Unhandled exception. System.InvalidCastException: Unable to cast object of type 'cs202Space.Program' to type 'cs202Space.ChildProgram'.
   at cs202Space.ChildProgram.Main() in C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\Program.cs:line 20

C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.exe (process 1228) exited with code -532462766 (0xe0434352).
Press any key to close this window . . .
```

## Toolbox

## Search Toolbox

## General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

```
ConsoleApp1.cs202Space.ChildProgram.Main()
1  namespace cs202Space
2  {
3      class Program //this is a class
4      {
5          public int data; //this is common (accessible) to all objects
6          public void excess32() //this is method...
7          public void show_data() //this is method...
8      }
9
10     class ChildProgram: Program //inherits base class Program
11     {
12         static void Main()
13         {
14             Program ramesh = (Program)new ChildProgram();
15             Program suresh = (Program)new ChildProgram();
16             ramesh.data=1;
17             suresh.data=2;
18
19             suresh.excess32();
20
21             ramesh.show_data();
22             suresh.show_data();
23         }
24     }
25 }
```

121% No issues found Ln: 27 Ch: 32 SPC CRLF

## Output

```
Show output from: Build
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 03:34 and took 00.439 seconds =====
```

## Server Explorer

## Toolbox

## Error List

## Output

Build succeeded

Add to Source Control Select Repository

26 03:34  
24-03-2025

## Solution Explorer

## Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)
ConsoleApp1
Dependencies
Program.cs

## Solution Explorer

## Properties





## Toolbox

## Search Toolbox

## General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

```
ConsoleApp1.cs202Space.ChildProgram.Main()
1 namespace cs202Space
2 {
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8     }
9
10    class ChildProgram: Program //inherits base class Program
11    {
12        static void Main()
13        {
14            Program ramesh = (Program)new ChildProgram();
15            Program suresh = (Program)new ChildProgram();
16            ramesh.data=1;
17            suresh.data=2;
18
19            suresh.excess32();
20
21            ramesh.show_data();
22            suresh.show_data();
23        }
24    }
25
26
27
28
29
30 }
```

121% No issues found

## Output

```
Show output from: Build
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.dll
=====
Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped
=====
Build completed at 03:34 and took 00.439 seconds
```

## Server Explorer

## Error List

## Output

Build succeeded

Add to Source Control Select Repository

24-03-2025

03:34

## Solution Explorer

## Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)
ConsoleApp1
Dependencies
Program.cs

## Solution Explorer

## Properties



Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

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ConsoleApp1.cs202Space.ChildProgramMain()
1 namespace cs202Space
2 {
3     class Program //this is a class
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11    {
12        static void Main()
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14            Program ramesh = (Program)new ChildProgram();
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17            suresh.data=2;
18
19            suresh.excess32();
20
21            ramesh.show_data();
22            suresh.show_data();
23        }
24    }
25
26
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28
29
30 }
```

121 % No issues found

Output

```
Microsoft Visual Studio Debug Console
1
34
C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\ConsoleApp1.exe
0 (0x0).
Press any key to close this window . . .
```

1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\ConsoleApp1.exe
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 03:35 and took 00.368 seconds =====

Server Explorer

Error List

Output

Build succeeded



GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
ConsoleApp1.cs202Space.ChildProgramMain()
1 namespace cs202Space
2 {
3     class Program //this is a class
4     {
5         public int data; //this is common (accessible) to all objects
6         public void excess32() //this is method...
7         public void show_data() //this is method...
8     }
9
10    class ChildProgram: Program //inherits base class Program
11    {
12        static void Main()
13        {
14            Program ramesh = (Program)new ChildProgram();
15            Program suresh = (Program)new ChildProgram();
16
17            ...
18
19            IDE0004 Cast is redundant.
20            Remove Unnecessary Cast
21            Introduce local
22            Move declaration near reference
23            Introduce parameter for '(Program)new ChildProgram()'
24            Change to 'as' expression
25            Inline temporary variable
26            Use implicit type
27            Suppress or configure issues
28
29            Show output from: Build
30
31            ...
32            Program ramesh = (Program)new ChildProgram();
33            Program suresh = (Program)new ChildProgram();
34            +Program suresh = new ChildProgram();
35            ramesh.data=1;
36            ...
37
38            Preview changes
39            Fix all occurrences in: Document | Project | Solution | Containing Member
40            | Containing Type
41
42            CRLF
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```

# Methods versus Events

- A user **clicks** a button in the UI.
- Someone **makes** an online payment.
- A user **sends** a chat message.
- A smartwatch **detects** an irregular heartbeat.
- A sensor reports a vehicle's location and speed **has changed**.
- A record is **inserted**, **updated**, or **deleted** in a database.
- An application **is starting** or **shutting down**.
- A warning that disk space is **running low**.

*Methods are often described as actions that an object can perform, either on itself or on related objects. Events are often described as actions that happen to an object.*

*Objects may raise (and consume) events as part of their processing. Events are important occurrences that you can act on in other parts of code, similar to (but more powerful than) exceptions.*

# Event Handling

- Upon occurrence of an **event**, you may need to perform some action (**response**).
- To perform this, you need to add an **event-handler** to your code.
- An event-handler is a method where the control flow reaches when a corresponding event occurs. To enable this, you first need to **configure** this handler to **listen (subscribe)** for the event of interest.

*Using events, you can create event - driven applications, which are far more prolific than you might think. For example, bear in mind that Windows - based applications are entirely dependent on events. Every button click or scrollbar drag you perform is achieved through event handling, as the events are triggered by the mouse or keyboard.*

*An important difference between events and exceptions is that there is no equivalent to the try...catch construct for handling events. Instead, a publisher-subscriber model is followed.*

# Events and Delegates

- Event handlers themselves are **simply functions**.
- The only restriction on an event handler function is that it must match the **return type and parameters** required by the event.
- This **restriction** is part of the definition of an event and is specified by a **delegate**.
- A delegate is a **type** that enables you to store **references to functions**.
- A delegate can be used to **call any function that matches the return type and parameters defined by the delegate**, giving you the ability to choose between several functions at runtime.

*A delegate is a type that safely encapsulates a method, like a function pointer in C and C++. Unlike C function pointers, delegates are object-oriented, type safe, and secure.*

# Events and Delegates in C# Console App.



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## Toolbox

## Search Toolbox

## General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

ConsoleApp3

```
class Program
{
    public delegate int mydel();

    public int fun1()
    {
        Console.WriteLine("hello from function 1");
        return 1;
    }

    public int fun2()
    {
        Console.WriteLine("hello from function 2");
        return 2;
    }

    public int fun3()
    {
        Console.WriteLine("hello from function 3");
        return 3;
    }

    static void Main(string[] args)
    {
        Program p = new Program();
        mydel obj = new mydel(p.fun1);
        obj += new mydel(p.fun2);
        obj += new mydel(p.fun3);
        Console.WriteLine(obj().ToString()); //will only print the value returned by the last function
    }
}
```

Output

Show output from: Build

```
1>Done building project "ConsoleApp3.csproj".
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped ======
===== Build completed at 20:43 and took 00.481 seconds ======
```

## Server Explorer

## Toolbox

## Error List

## Output



Item(s) Saved



## Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp3' (1 of 1 project)

- ConsoleApp3
  - Dependencies
  - Program.cs

Solution Explorer

Properties



## Toolbox

Search Toolbox

## Program.cs

ConsoleApp3

```
1 class Program
2 {
3     public delegate int mydel();
4
5     public int fun1()
6     {
7         Console.WriteLine("hello from function 1");
8         return 1;
9     }
10    public int fun2()
11    {
12        Console.WriteLine("hello from function 2");
13        return 2;
14    }
15    public int fun3()
16    {
17        Console.WriteLine("hello from function 3");
18        return 3;
19    }
20    static void Main(string[] args)
21    {
22        Program p = new Program();
23        mydel obj = new mydel(p.fun1);
24        obj += new mydel(p.fun2);
25        obj += new mydel(p.fun3);
26        Console.WriteLine(obj().ToString());
27    }
}
```

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Output

Show output from: Build

1&gt;Done building project "ConsoleApp3.csproj".

===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====

===== Build completed at 20:46 and took 00.498 seconds =====

## Microsoft Visual Studio Debug Console

hello from function 1

hello from function 2

hello from function 3

3

C:\Users\shouwick\Desktop\IITGN\playground\Console

0 (0x0).

Press any key to close this window . . .

## Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp3' (1 of 1 project)

ConsoleApp3

Dependencies

Program.cs

Solution Explorer

Git Changes

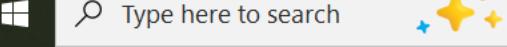
Server Explorer

Toolbox

Error List

Output

Build succeeded

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GitHub Copilot

## Toolbox

## Search Toolbox

## General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

C# ConsoleApp3 Program Main(string[] args)

```
1 class Program
2 {
3     public delegate void mydel();
4
5     public void fun1()
6     {
7         Console.WriteLine("hello from function 1");
8     }
9     public void fun2()
10    {
11        Console.WriteLine("hello from function 2");
12    }
13    public void fun3()
14    {
15        Console.WriteLine("hello from function 3");
16    }
17    static void Main(string[] args)
18    {
19        Program p = new Program();
20        mydel obj = new mydel(p.fun1);
21        obj += new mydel(p.fun2);
22        obj += new mydel(p.fun3);
23        obj();
24    }
25 }
```

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## Output

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1>Done building project "ConsoleApp3.csproj".  
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===== Build completed at 20:47 and took 00.491 seconds ======

## Server Explorer

## Toolbox

## Error List

## Output



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## Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp3' (1 of 1 project)

ConsoleApp3

Dependencies

Program.cs

Solution Explorer Git Changes

## Properties





Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

ConsoleApp3

Program

Main(string[] args)

```
1 class Program
2 {
3     public delegate void mydel();
4
5     public void fun1()
6     {
7         Console.WriteLine("hello from function 1");
8     }
9     public void fun2()
10    {
11        Console.WriteLine("hello from function 2");
12    }
13    public void fun3()
14    {
15        Console.WriteLine("hello from function 3");
16    }
17    static void Main(string[] args)
18    {
19        Program p = new Program();
20        mydel obj = new mydel(p.fun1);
21        obj += new mydel(p.fun2);
22        obj += new mydel(p.fun3);
23        obj();
24    }
25 }
```

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Output

Show output from: Build

## Microsoft Visual Studio Debug Console

```
hello from function 1
hello from function 2
hello from function 3
```

C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp3\0 (0x0).  
Press any key to close this window . . .



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## Toolbox

## Search Toolbox

## General

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## Program.cs\*

ConsoleApp4 DeleEventExam.Subscriber\_class

Ring0

```
{ 1
 2 namespace DeleEventExam
 3 {
 4     > 5     class Subscriber_class...
 5     > 6     class Publisher_class...
 6     > 7 }
 7 }
```

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Output

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===== Build completed at 21:05 and took 00.434 seconds =====

## Server Explorer

## Toolbox

## Error List

## Output

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## Toolbox

## Search Toolbox

## General

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## Program.cs\*

ConsoleApp4

```
namespace DeleEventExam
{
    class Subscriber_class
    {
        public static void Ring()
        {
            Console.WriteLine("Good Morning....");
            Thread.Sleep(5000);
        }
    }
    class Publisher_class...
}
```

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## Output

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```
1>ConsoleApp4 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp4\bin\Debug\net8.0\ConsoleApp4.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 21:05 and took 00.434 seconds =====
```

## Server Explorer

## Toolbox

## Error List

## Output

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## Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp4' (1 of 1 project)

ConsoleApp4

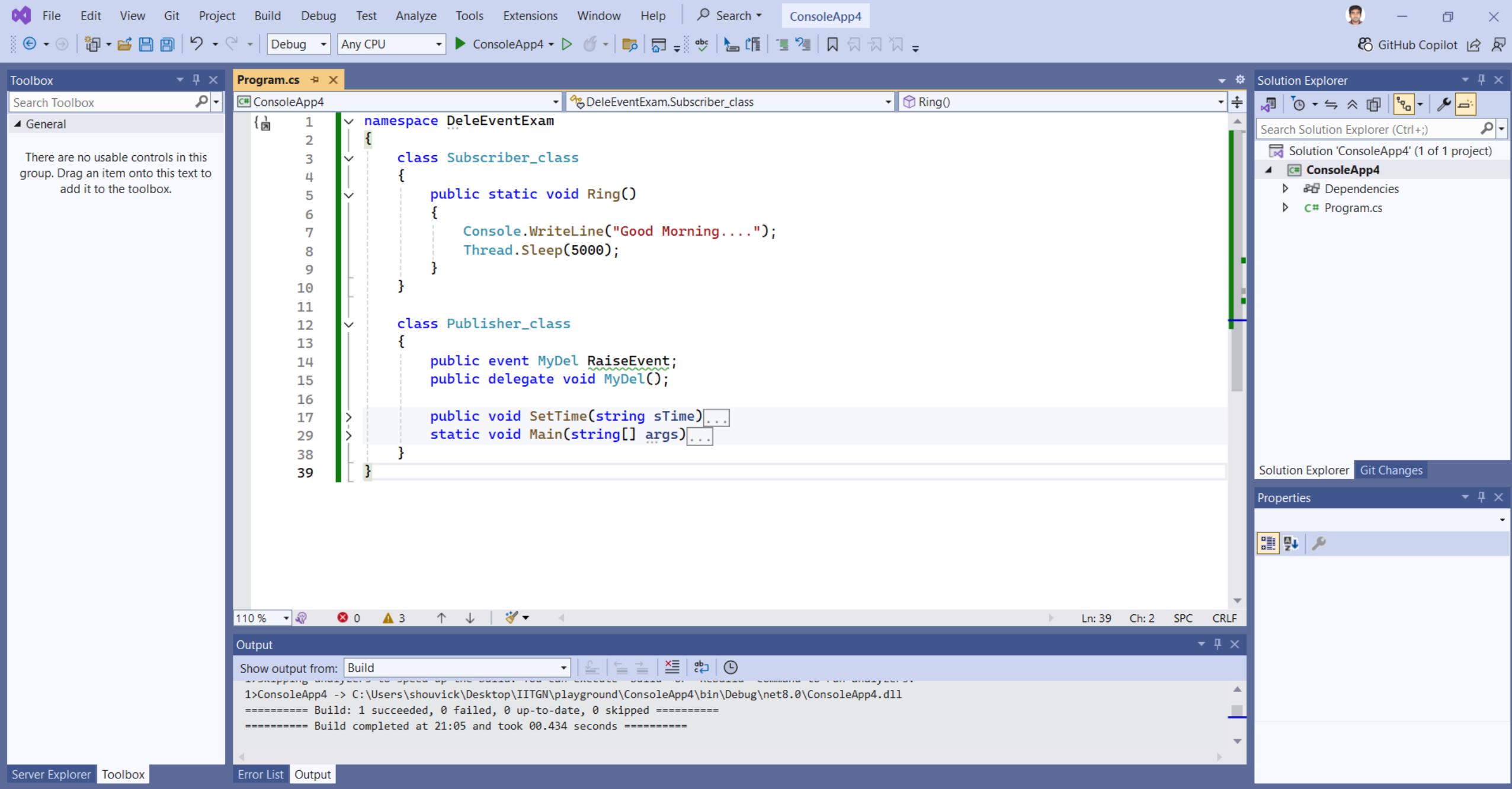
Dependencies

Program.cs

Solution Explorer Git Changes

## Properties







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## Toolbox

## Search Toolbox

## General

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## Program.cs

C# ConsoleApp4 DeleEventExam.Publisher\_class SetTime(string sTime)

```
1  namespace DeleEventExam
2  {
3      class Subscriber_class
4      {
5          public static void Ring()...
6      }
7
8      class Publisher_class
9      {
10         public event MyDel RaiseEvent;
11         public delegate void MyDel();
12
13         public void SetTime(string sTime)
14         {
15             string currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
16             while (currTime != sTime)
17             {
18                 Console.WriteLine(" Tick ..");
19                 Thread.Sleep(1000);
20                 currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
21             }
22             RaiseEvent();
23         }
24
25         static void Main(string[] args)...
26     }
27
28 }
```

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Output

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1>ConsoleApp4 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp4\bin\Debug\net8.0\ConsoleApp4.dll  
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====  
===== Build completed at 21:05 and took 00.434 seconds =====

## Server Explorer

## Toolbox

## Error List

## Output

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## Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp4' (1 of 1 project)

ConsoleApp4

Dependencies

Program.cs

## Solution Explorer

## Properties

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## Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

```
ConsoleApp4 DeleEventExam.Publisher_class SetTime(string sTime)
1  namespace DeleEventExam
2  {
3      class Subscriber_class...
4
5      class Publisher_class
6      {
7          public event MyDel RaiseEvent;
8          public delegate void MyDel();
9
10         public void SetTime(string sTime)
11         {
12             string currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
13             while (currTime != sTime)
14             {
15                 Console.WriteLine(" Tick ..");
16                 Thread.Sleep(1000);
17                 currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
18             }
19             RaiseEvent();
20         }
21     }
22
23     static void Main(string[] args)...
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39 }
```

MyDel Publisher\_class.RaiseEvent

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## Output

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===== Build completed at 21:05 and took 00.434 seconds =====

## Server Explorer

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## Output

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## Toolbox

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## General

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## Program.cs

```
C# ConsoleApp4 DeleEventExam.Publisher_class Main(string[] args)
13 {
14     public event MyDel RaiseEvent;
15     public delegate void MyDel();
16
17     public void SetTime(string sTime)
18     {
19         string currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
20         while (currTime != sTime)
21         {
22             Console.WriteLine(" Tick ..");
23             Thread.Sleep(1000);
24             currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
25         }
26         RaiseEvent();
27     }
28
29     static void Main(string[] args)
30     {
31         Publisher_class p = new Publisher_class();
32
33         p.RaiseEvent += new MyDel(Subscriber_class.Ring);
34         Console.WriteLine("Enter Time (HH:MM)");
35         string t = Console.ReadLine();
36         p.SetTime(t);
37     }
38 }
39 }
```

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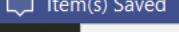
## Output

```
Show output from: Build
1>ConsoleApp4 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp4\bin\Debug\net8.0\ConsoleApp4.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 21:05 and took 00.434 seconds =====
```

## Server Explorer

## Error List

## Output



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## Solution Explorer

Search Solution Explorer (Ctrl+;) Solution 'ConsoleApp4' (1 of 1 project) ConsoleApp4 Dependencies Program.cs

## Solution Explorer

Properties



## Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

```
C# ConsoleApp4 DeleEventExam.Publisher_class Main(string[] args)
13 {
14     public event MyDel RaiseEvent;
15     public delegate void MyDel();
16
17     public void SetTime(string sTime)
18     {
19         string currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
20         while (currTime != sTime)
21         {
22             Console.WriteLine(" Tick ..");
23             Thread.Sleep(1000);
24             currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
25         }
26         RaiseEvent();
27     }
28
29     static void Main(string[] args)
30     {
31         Publisher_class p = new Publisher_class();
32
33         p.RaiseEvent += new MyDel(Subscriber_class.Ring);
34         Console.WriteLine(" MyDel Publisher_class.RaiseEvent ");
35         string t = "10:00";
36         p.SetTime(t);
37     }
38 }
39 }
```

110% 0 3 Ln: 33 Ch: 19 SPC CRLF

## Output

```
Show output from: Build
1>ConsoleApp4 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp4\bin\Debug\net8.0\ConsoleApp4.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 21:05 and took 00.434 seconds =====
```

## Server Explorer

## Toolbox

## Error List

## Output

Add to Source Control Select Repository

21:11

06-04-2025

## Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp4' (1 of 1 project)
ConsoleApp4
Dependencies
Program.cs

Solution Explorer Git Changes

Properties



Type here to search



Ready Add to Source Control Select Repository

ENG 06-04-2025



## Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

```
C# ConsoleApp4 DeleEventExam.Publisher_class Main(string[] args)
13 {
14     public event MyDel RaiseEvent;
15     public delegate void MyDel();
16
17     public void SetTime(string sTime)
18     {
19         string currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
20         while (currTime != sTime)
21         {
22             Console.WriteLine(" Tick ..");
23             Thread.Sleep(1000);
24             currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
25         }
26         RaiseEvent();
27     }
28
29     static void Main(string[] args)
30     {
31         Publisher_class p = new Publisher_class();
32
33         p.RaiseEvent += new MyDel(Subscriber_class.Ring);
34         Console.WriteLine(" Subscribers registered");
35         string t = Console.ReadLine();
36         p.SetTime(t);
37     }
38 }
39 }
```

110% 0 3 Ln: 33 Ch: 19 SPC CRLF

## Output

```
Show output from: Build
1>Building analysis to speed up the build. You can execute build or rebuild command to run analysis.
1>ConsoleApp4 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp4\bin\Debug\net8.0\ConsoleApp4.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 21:05 and took 00.434 seconds =====
```

## Server Explorer

## Toolbox

## Error List

## Output

↑ Add to Source Control ▾ Select Repository ▾



Type here to search



Ready

21:11  
06-04-2025

ENG

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Help | Search ConsoleApp4 GitHub Copilot

Solution Explorer

Search Solution Explorer (Ctrl+;) 🔎

Solution 'ConsoleApp4' (1 of 1 project)

ConsoleApp4

Dependencies

Program.cs

Solution Explorer

Git Changes

Properties



## Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

```
C# ConsoleApp4 DeleEventExam.Publisher_class Main(string[] args)
13 {
14     public event MyDel RaiseEvent;
15     public delegate void MyDel();
16
17     public void SetTime(string sTime)
18     {
19         string currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
20         while (currTime != sTime)
21         {
22             Console.WriteLine(" Tick ..");
23             Thread.Sleep(1000);
24             currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
25         }
26         RaiseEvent();
27     }
28
29     static void Main(string[] args)
30     {
31         Publisher_class p = new Publisher_class();
32
33         p.RaiseEvent += new MyDel(Subscriber_class.Ring);
34         Console.WriteLine("Enter time: ");
35         string t = Console.ReadLine();
36         p.SetTime(t);
37     }
38 }
39 }
```

110% 0 3 Ln: 33 Ch: 19 SPC CRLF

## Output

```
Show output from: Build
1>ConsoleApp4 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp4\bin\Debug\net8.0\ConsoleApp4.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 21:05 and took 00.434 seconds =====
```

## Server Explorer

## Error List

## Output

↑ Add to Source Control ▾ Select Repository ▾

## Toolbox

## Search Toolbox

## General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

## Program.cs

```
ConsoleApp4.cs DeleEventExam.Publisher_class Main(string[] args)
13 {
14     public event MyDel RaiseEvent;
15     public delegate void MyDel();
16
17     public void SetTime(string sTime)
18     {
19         string currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
20         while (currTime != sTime)
21         {
22             Console.WriteLine(" Tick ..");
23             Thread.Sleep(1000);
24             currTime = DateTime.Now.TimeOfDay.ToString().Substring(0, 5);
25         }
26         RaiseEvent();
27     }
28
29     static void Main(string[] args)
30     {
31         Publisher_class p = new Publisher_class();
32
33         p.RaiseEvent += new MyDel(Subscriber_class.Ring);
34         Console.WriteLine("Enter Time (HH:MM)");
35         string t = Console.ReadLine();
36         p.SetTime(t);
37     }
38 }
39 }
```

Output

```
Show output from: Build
1>ConsoleApp4 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp4\bin\Debug\net8.0\ConsoleApp4.exe
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped ======
===== Build completed at 21:12 and took 00.503 seconds ======
```

## Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp4' (1 of 1 project)

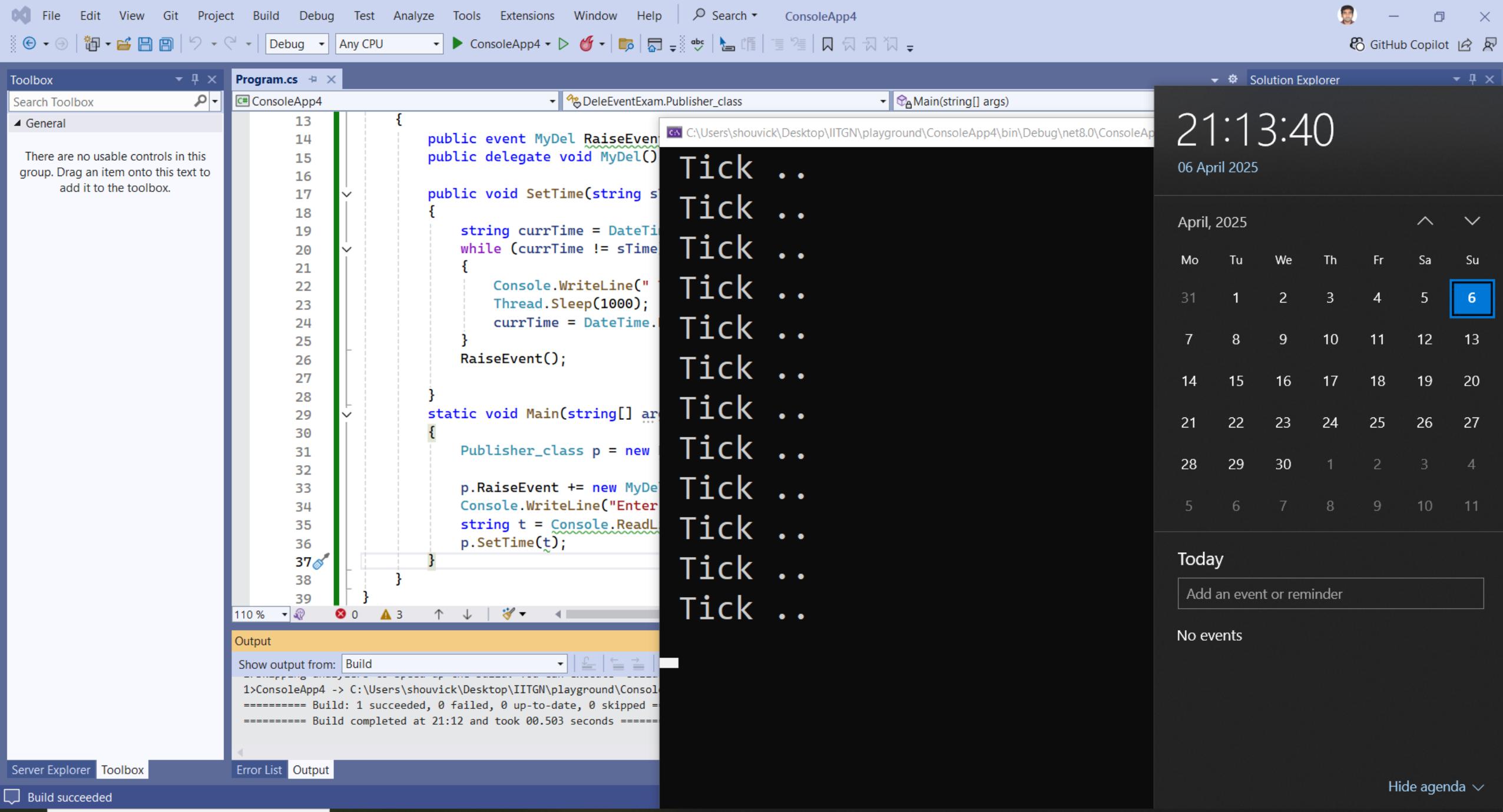
- ConsoleApp4
  - Dependencies
  - Program.cs

C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp4\bin\Debug\net8.0\ConsoleApp4.exe

Enter Time (HH:MM)

21:14

Tick ..  
Tick ..  
Tick ..  
Tick ..  
Tick ..



Toolbox ▾ X Program.cs ▾ X

ConsoleApp4 C# C:\Users\shouwick\Desktop\ITGN\playground\ConsoleApp4\bin\Debug\net8.0\ConsoleApp4.exe

```
13 {  
14     public static void Main(string[] args)  
15     {  
16         for (int i = 0; i < 4; i++)  
17         {  
18             Console.WriteLine("Tick ..");  
19             Thread.Sleep(1000);  
20         }  
21         Console.WriteLine("Good Morning....");  
22     }  
23 }  
24  
25 }  
26  
27 }  
28 }  
29 }  
30 }  
31  
32  
33  
34  
35  
36 }  
37 }  
38 }  
39 }
```

110 % 0 3 110 %

Output

Show output from: Build

```
1>ConsoleApp4 -> C:\Users\shouwick\Desktop\ITGN\playground\ConsoleApp4\bin\Debug\net8.0\ConsoleApp4.exe  
===== Build: 1 succeeded, 0 failed  
===== Build completed at 21:12
```

Server Explorer Toolbox Error List Output

Build succeeded

Solution Explorer

21:14:02  
06 April 2025

April, 2025

Mo	Tu	We	Th	Fr	Sa	Su
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	1	2	3	4
5	6	7	8	9	10	11

Today

Add an event or reminder

No events

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
13
14
15
16
17
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25
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27
28
29
30
31
32
33
34
35
36
37
38
39
```

Microsoft Visual Studio Debug Console

```
Tick ...
Tick ...
Tick ...
Tick ...
Good Morning....
```

```
C:\Users\shouwick\Desktop\IITGN\playground (0x0).
Press any key to close this window .
```

Output

```
Show output from: Build
1>ConsoleApp4 -> C:\Users\shouwick\
===== Build: 1 succeeded, 0 failed
===== Build completed at 21:12
```

Solution Explorer

21:14:09  
06 April 2025

April, 2025

Mo	Tu	We	Th	Fr	Sa	Su
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	1	2	3	4
5	6	7	8	9	10	11

Today

Add an event or reminder

No events

# Texts, References, and Acknowledgements

## Textbook:

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- Soni, M. (2016). *DevOps for Web Development*. Packt Publishing Ltd.
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