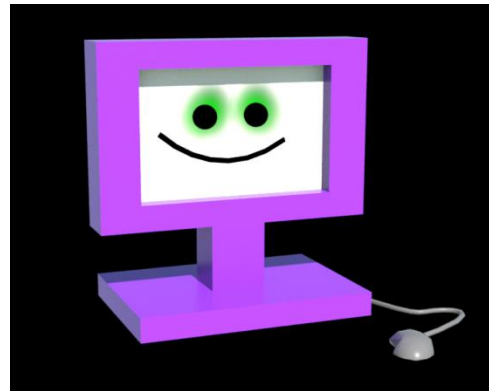


Great way to learn is by example so fire up  
Visual Studios C++ 2015 (at home make sure  
you custom install with C++ - no longer default)



by Deborah R. Fowler  
[www.deborahrfowler.com](http://www.deborahrfowler.com)

Start Page

# Visual Studio

Start

- New Project...
- Open Project...
- Open from Source Control...

Recent

- ConsoleApplication12
- ConsoleApplication11 project2
- ConsoleApplication10
- W16\_V375\_Project\_CaputoKatie project2
- ConsoleApplication9
- ConsoleApplication8
- OpenGL\_TankTemplateNew
- W16\_V375\_E4\_CaputoKatie

## Discover Visual Studio Community 2015

New to Visual Studio? Check out coding tutorials and sample projects  
 Get training on new frameworks, languages, and technologies  
 Create a private code repo and backlog for your project  
 See how easy it is to get started with cloud services  
 Discover ways to extend and customize the IDE

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### New on Microsoft Platforms

- Windows
- Microsoft Azure
- ASP.NET and Web

### News

[How six lines of code + SQL Server can bring Deep Learning to ANY App](#)  
 Deep Learning is a hot buzzword of today. The recent results and applications are incredibly promising, spanning areas such as speech recognition, language...

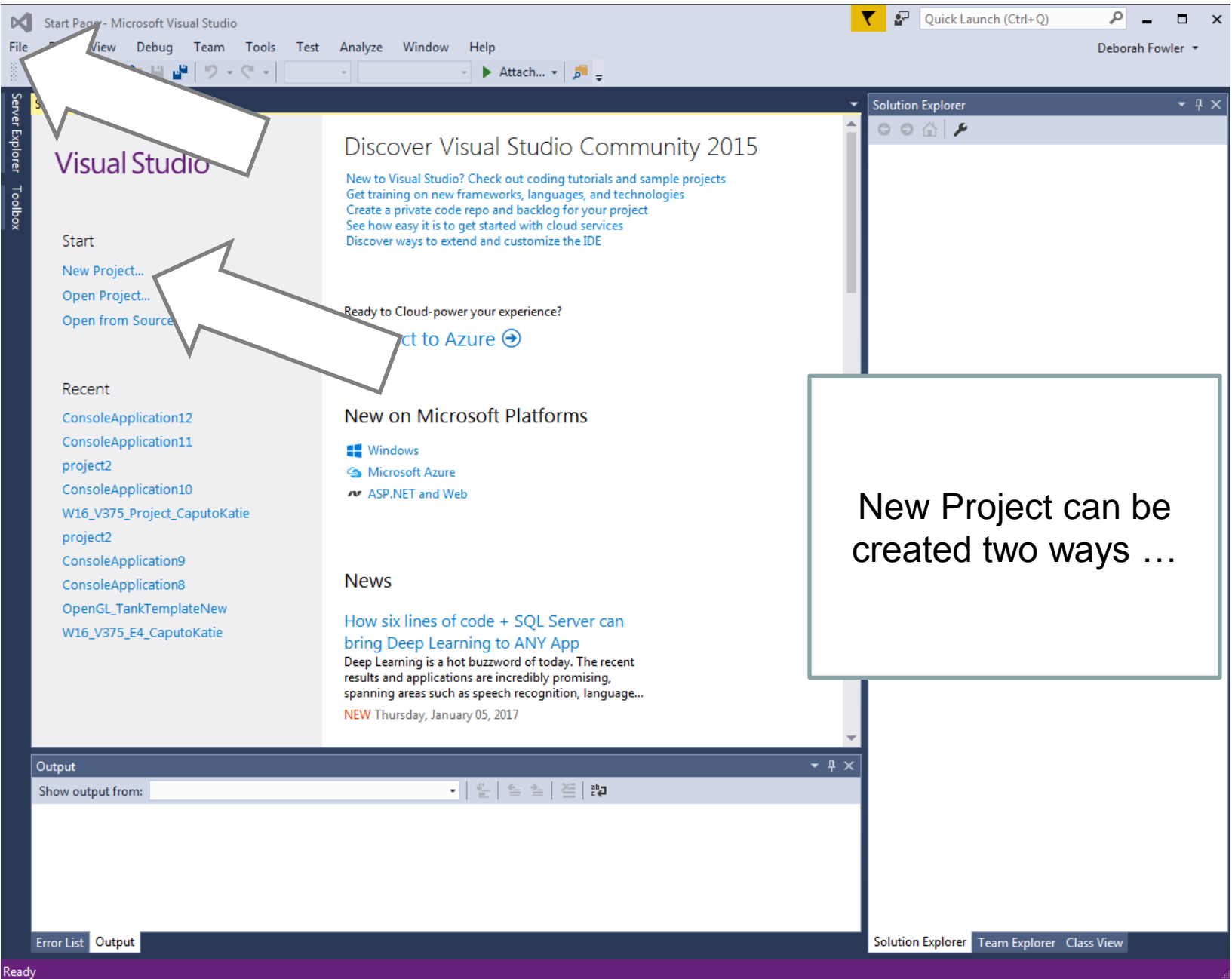
NEW Thursday, January 05, 2017

Solution Explorer

Output

Show output from:

Solution Explorer Team Explorer Class View



Visual Studio

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### Start

- New Project...
- Open Project...
- Open from Source...

### Recent

- ConsoleApplication12
- ConsoleApplication11 project2
- ConsoleApplication10
- W16\_V375\_Project\_CaputoKatie project2
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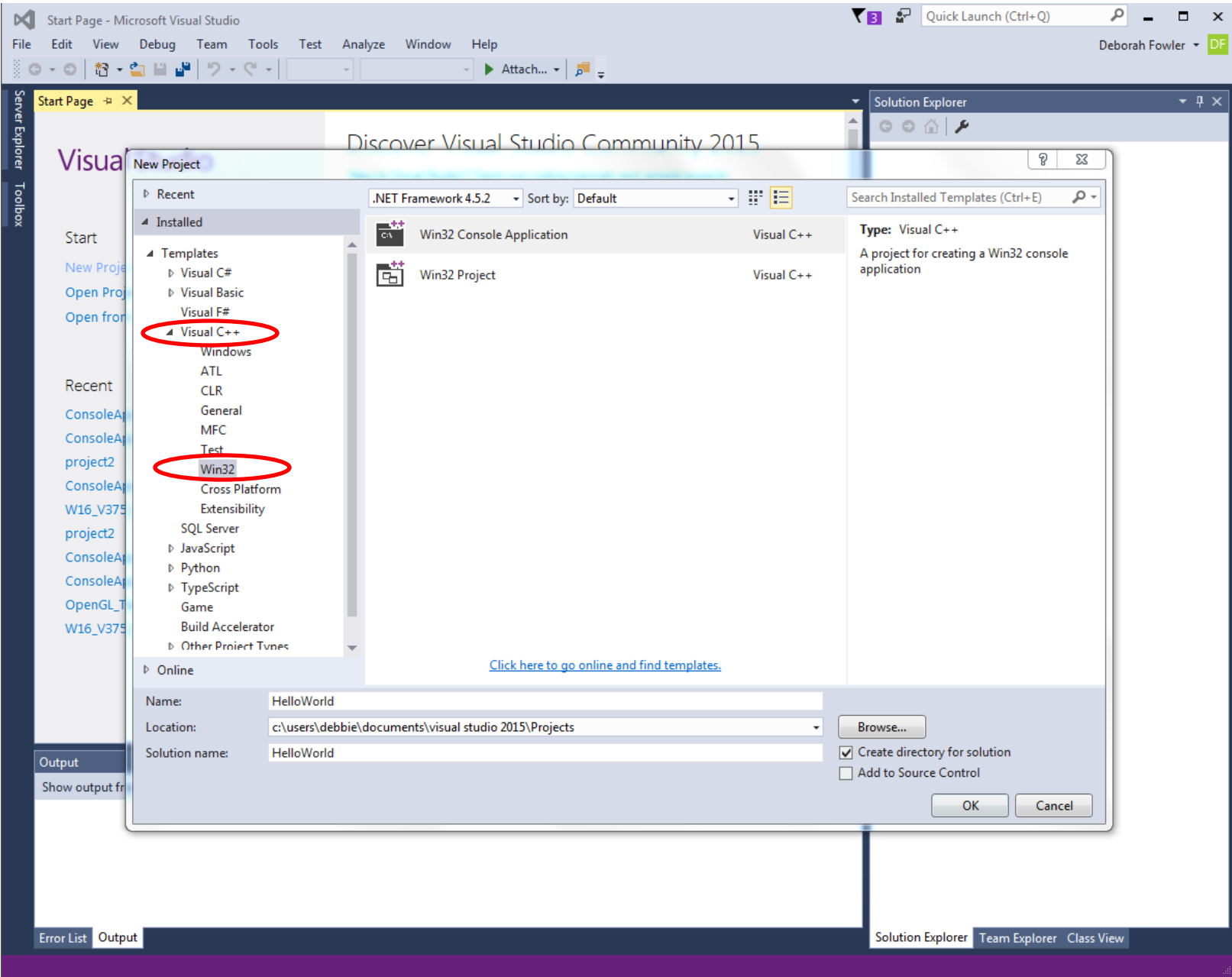
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- Windows
- Microsoft Azure
- ASP.NET and Web

### News

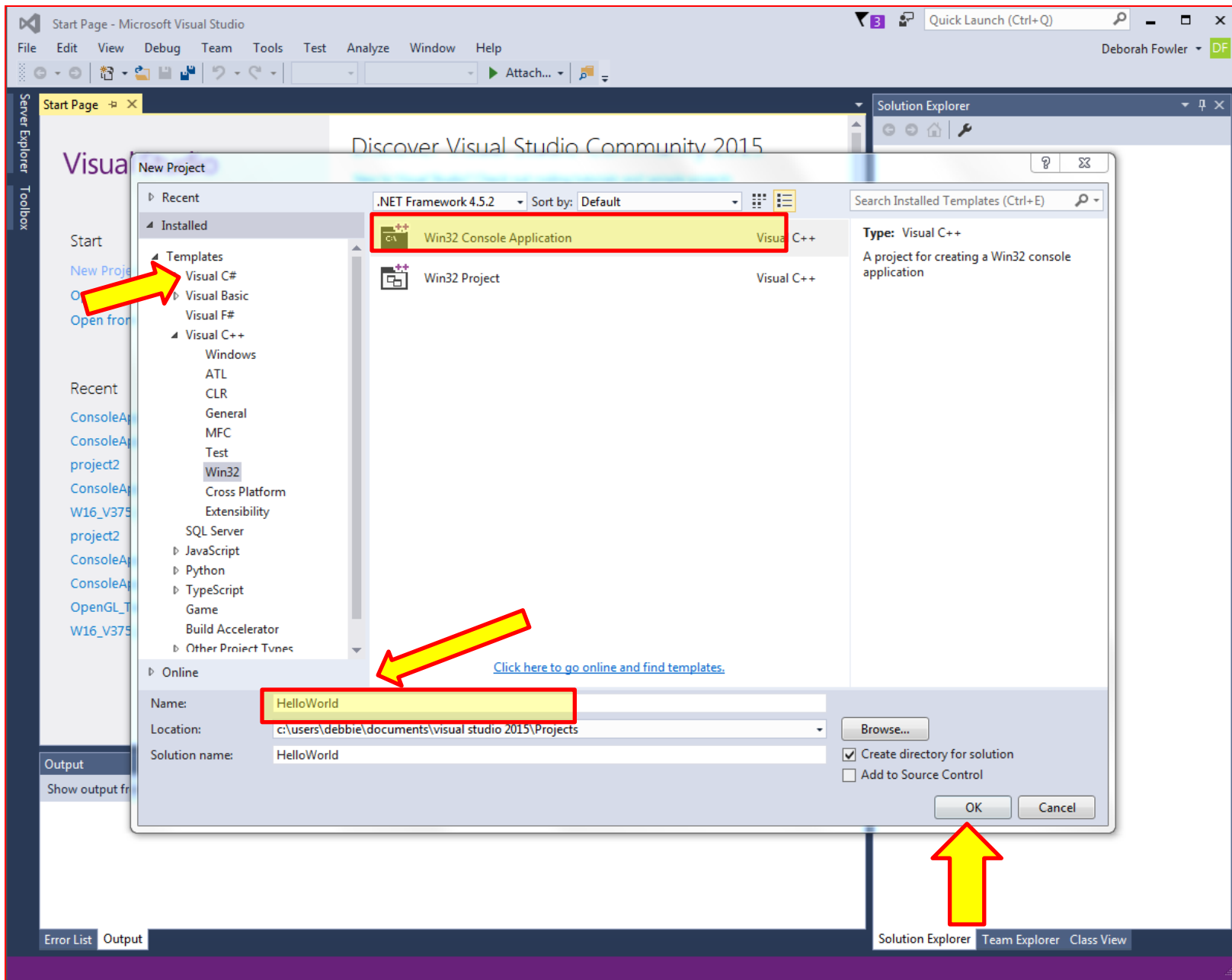
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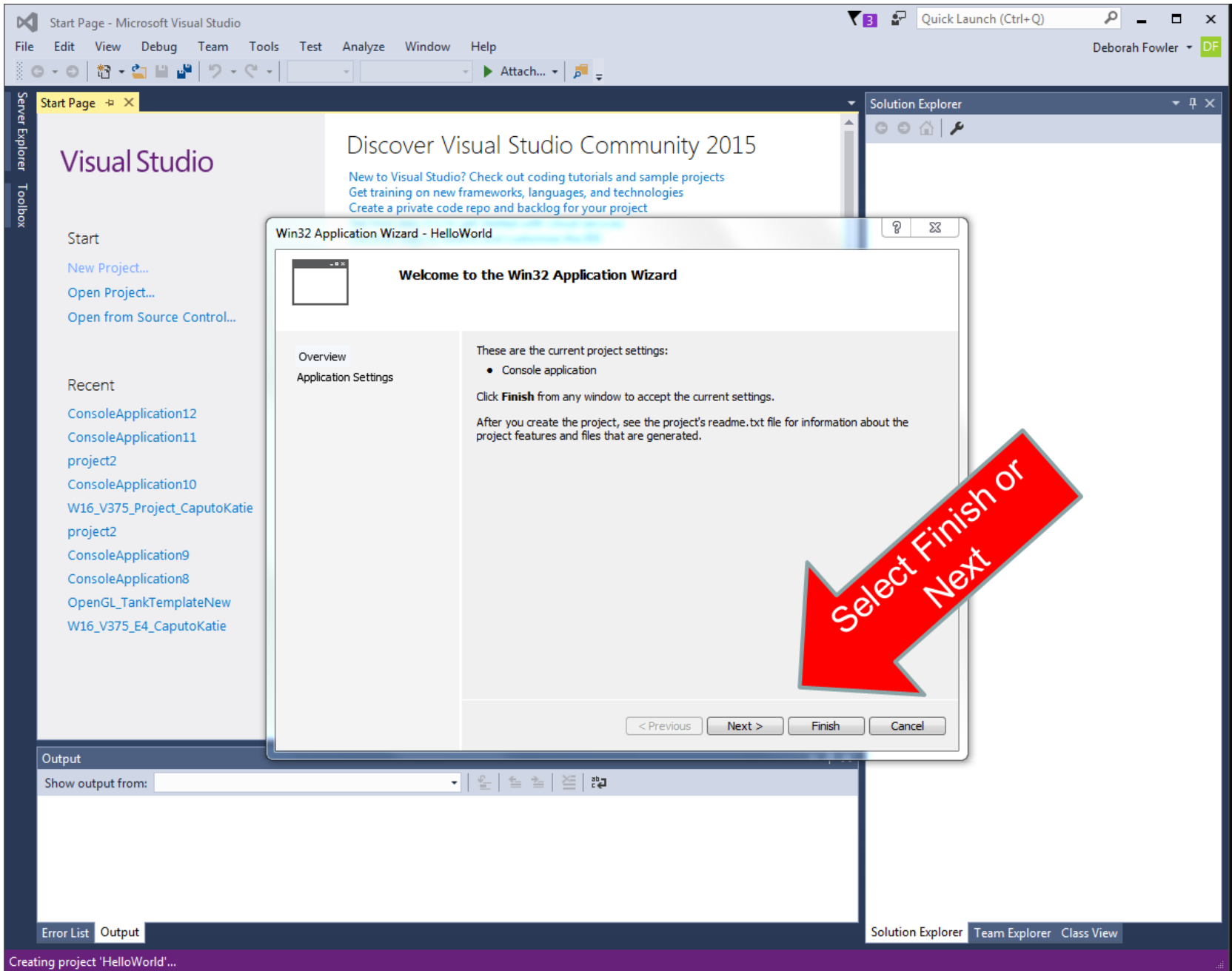
New Project can be created two ways ...

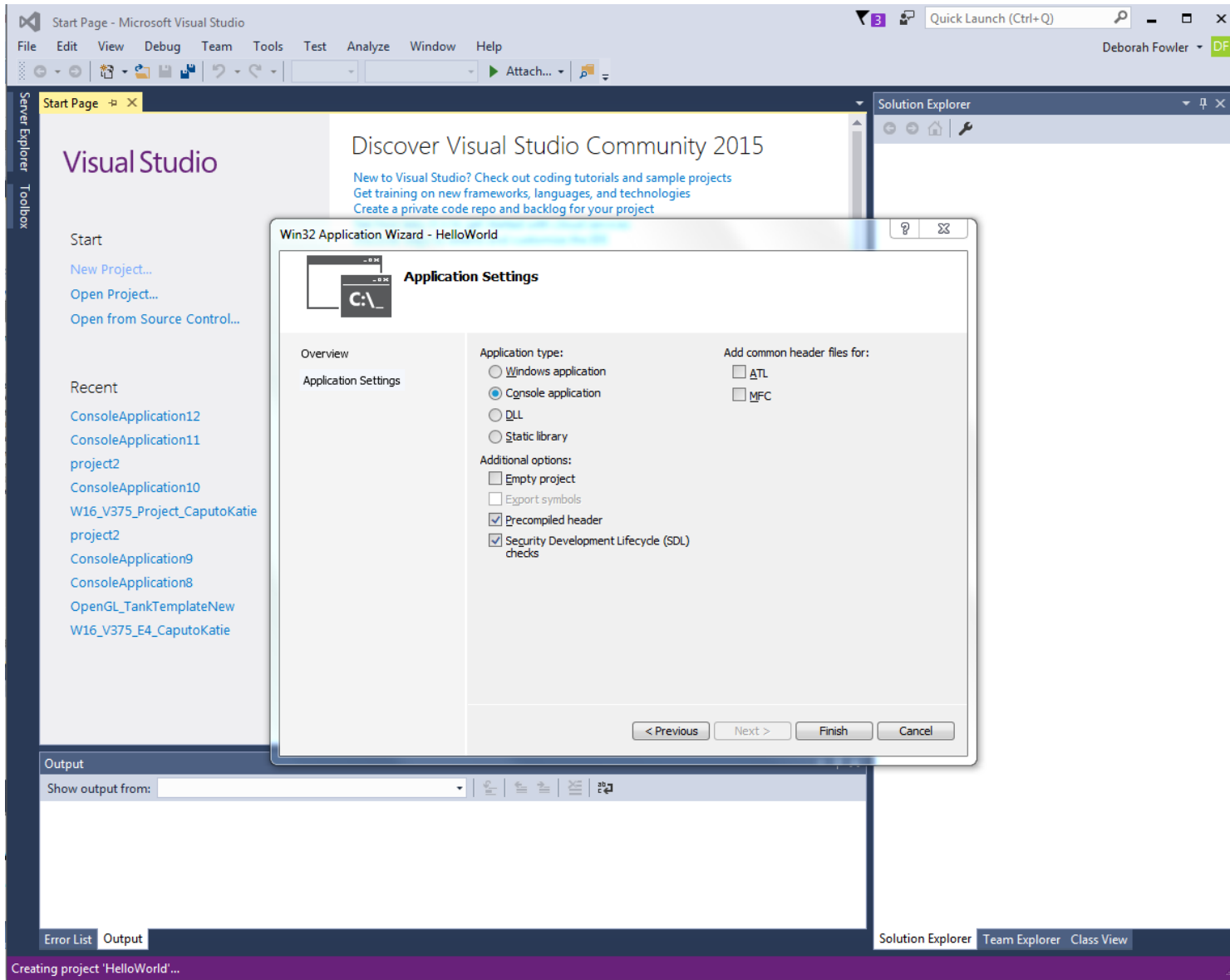


Error List Output

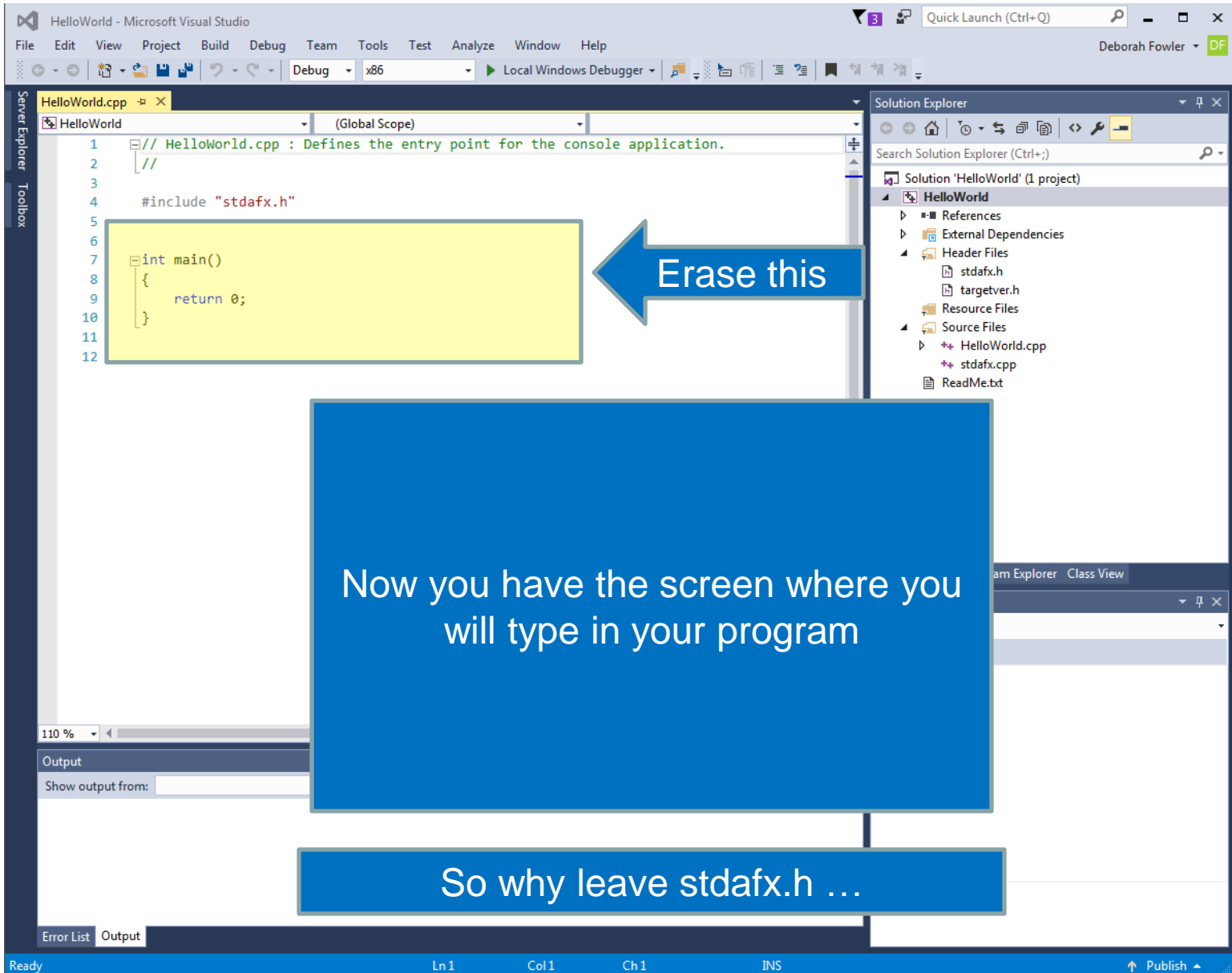
Solution Explorer Team Explorer Class View







If you hit next you will see this, hit finish  
Default settings are correct



```
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5
6
7 int main()
8 {
9     return 0;
10 }
11
12
```

Erase this

Now you have the screen where you will type in your program

So why leave stdafx.h ...

Solution Explorer

Search Solution Explorer (Ctrl+;)

- Solution 'HelloWorld' (1 project)
  - HelloWorld
    - References
    - External Dependencies
    - Header Files
      - stdafx.h
      - targetver.h
    - Resource Files
    - Source Files
      - HelloWorld.cpp
      - stdafx.cpp
      - ReadMe.txt



- **stdafx.h** - is a precompiled file (all things above it are assumed precompiled)
- Stands for Application Framework eXtensions. Includes precompiled files that are frequently used and rarely changed.
- If you type in examples from the textbook, make sure you have this line

Now type in your first program

```
#include stdafx.h  
#include <iostream>
```

```
int main()  
{  
    std::cout << "Hello World! \n";  
    std::cout << "Press Enter or Return to exit.";  
    std::cin.get();  
  
    return 0;  
}
```

```
1 // HelloWorld.cpp : This file contains the console application.
2 //
3 //
4 #include "stdafx.h"
5 #include <iostream>
6
7
8 int main()
9 {
10     std::cout << "Hello World\n";
11     std::cout << "Press Enter or Return to exit.";
12     std::cin.get();
13
14     return 0;
15 }
16
17
```

Build invokes the compiler

Solution Explorer

Search Solution Explorer (Ctrl+;)

- Solution 'HelloWorld' (1 project)
  - HelloWorld
    - References
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      - stdafx.h
      - targetver.h
    - Resource Files
    - Source Files
      - HelloWorld.cpp
      - stdafx.cpp
      - ReadMe.txt

Solution Explorer Team Explorer Class View

Properties

main VCCodeFunction

C++	
(Name)	main
File	c:\Users\Debbie\Documents
FullName	main
IsDefault	False
IsDelete	False
IsFinal	False
IsInjected	False
IsInline	False
IsOverloaded	False

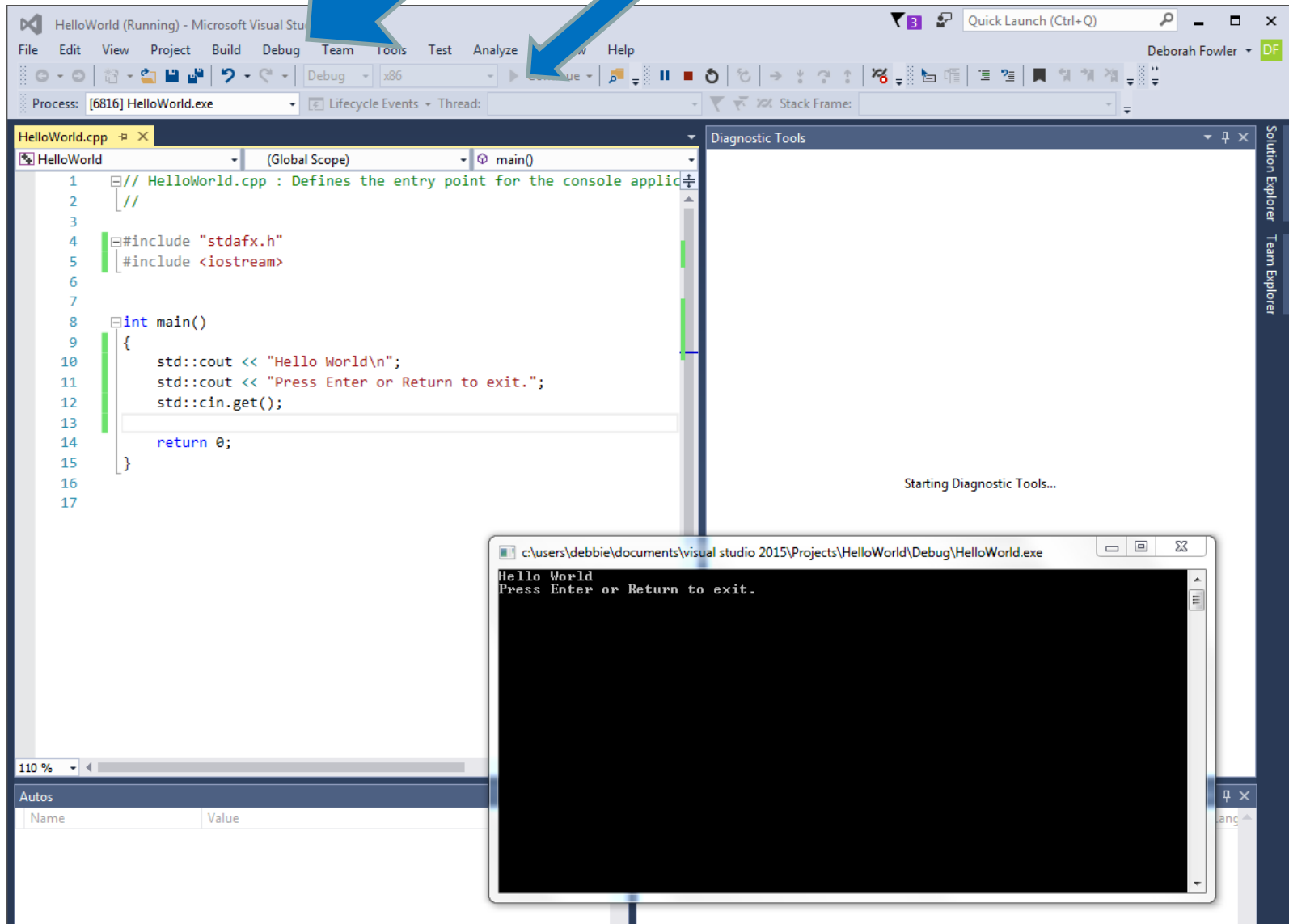
Output

Show output from: Build

```
1>----- Build started: Project: HelloWorld, Configuration: Debug Win32 -----
1> stdafx.cpp
1> HelloWorld.cpp
1> HelloWorld.vcxproj -> c:\users\debbie\documents\visual studio 2015\Projects\HelloWorld\Debug\HelloWorld.exe
1> HelloWorld.vcxproj -> c:\users\debbie\documents\visual studio 2015\Projects\HelloWorld\Debug\HelloWorld.exe
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
```

Shows it worked correctly

Run the program by selecting **Start Debugging** from the **Debug** pull-down menu. *If it is out of date* it will ask “do you want to build your project “ (invokes compiler) (or run by pressing the green arrow)



Now let's examine the code:

```
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6
7
8 int main()
9 {
10     std::cout << "Hello World\n";
11     std::cout << "Press Enter or Return to exit.";
12     std::cin.get();
13
14     return 0;
15 }
```

C++ provides ways to do input/output  
#include tells the pre-processor this is from a standard library

C++ programs have a function called main() which is the starting point

**int main() - is a function**

**A function is a group of programming code that does some work and returns a value (return 0; will be our last line).**

```
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6
7
8 int main()
9 {
10     std::cout << "Hello World\n";
11     std::cout << "Press Enter or Return to exit.";
12     std::cin.get();
13
14     return 0;
15 }
```

A blue arrow points from the text `std::cout` to the `std::cout` usage in the code on line 10.

`std` is the namespace (like a phone number's area code)  
`::` scope resolution operator  
**Note that statements end in a semicolon in C++**  
**Will print what is in the quotation marks (string literal)**

Microsoft Visual Studio interface showing a C++ program named HelloWorld.cpp. The code is as follows:

```
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6
7
8 int main()
9 {
10     std::cout << "Hello World\n";
11     std::cout << "Press Enter or";
12     std::cin.get();
13
14     return 0;
15 }
```

A blue callout box with the text "Why are these here?" points to lines 10 and 11 of the code.

**These lines are to allow us to see the console window  
It prints the message and then waits for the user to input a value  
Right now delete those two lines and run your program (then add  
them back in)**



# Coding Standards

```
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6
7
8 int main()
9 {
10     std::cout << "Hello World\n";
11     std::cout << "Press Enter or Return to exit.";
12     std::cin.get();
13
14     return 0;
15 }
```

**Note that the main() function body (group of statements) is surrounded by curly braces – this defines a block  
Coding standards for this class will have these lined up as above**

```
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6
7
8 int main()
9 {
10     std::cout << "Hello World\n";
11     std::cout << "Press Enter or Return to exit.";
12     std::cin.get();
13
14     return 0;
15 }
```

**What are coding standards? All code written in class or on the job must conform to coding standards (the use of naming conventions and whitespace – formatting – of the program)**

**This is not the same as syntax – the rules to construct a legal statement or expression**

```
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6
7
8 int main()
9 {
10     std::cout << "Hello World\n";
11     std::cout << "Press Enter or Return to exit.";
12     std::cin.get();
13
14     return 0;
15 }
16
```

**A complete list of the coding standards can be found on the class website – these will be mentioned as we introduce items as well**

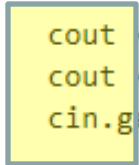
```
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6
7
8 int main()
9 {
10     std::cout << "Hello World\n";
11     std::cout << "Press Enter or Return to exit.";
12     std::cin.get();
13
14     return 0;
15 }
16
```

In C++, you can use the keyword “using” and namespace to avoid having to type “std::” each time we use cout and cin

Example: using namespace std (called a using directive)

Example: using std::cout (called a using declaration)

```
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6 using namespace std;
7
8
9 int main()
10 {
11     cout << "Hello World\n";
12     cout << "Press Enter or Return to exit.";
13     cin.get();
14
15     return 0;
16 }
17
18
```

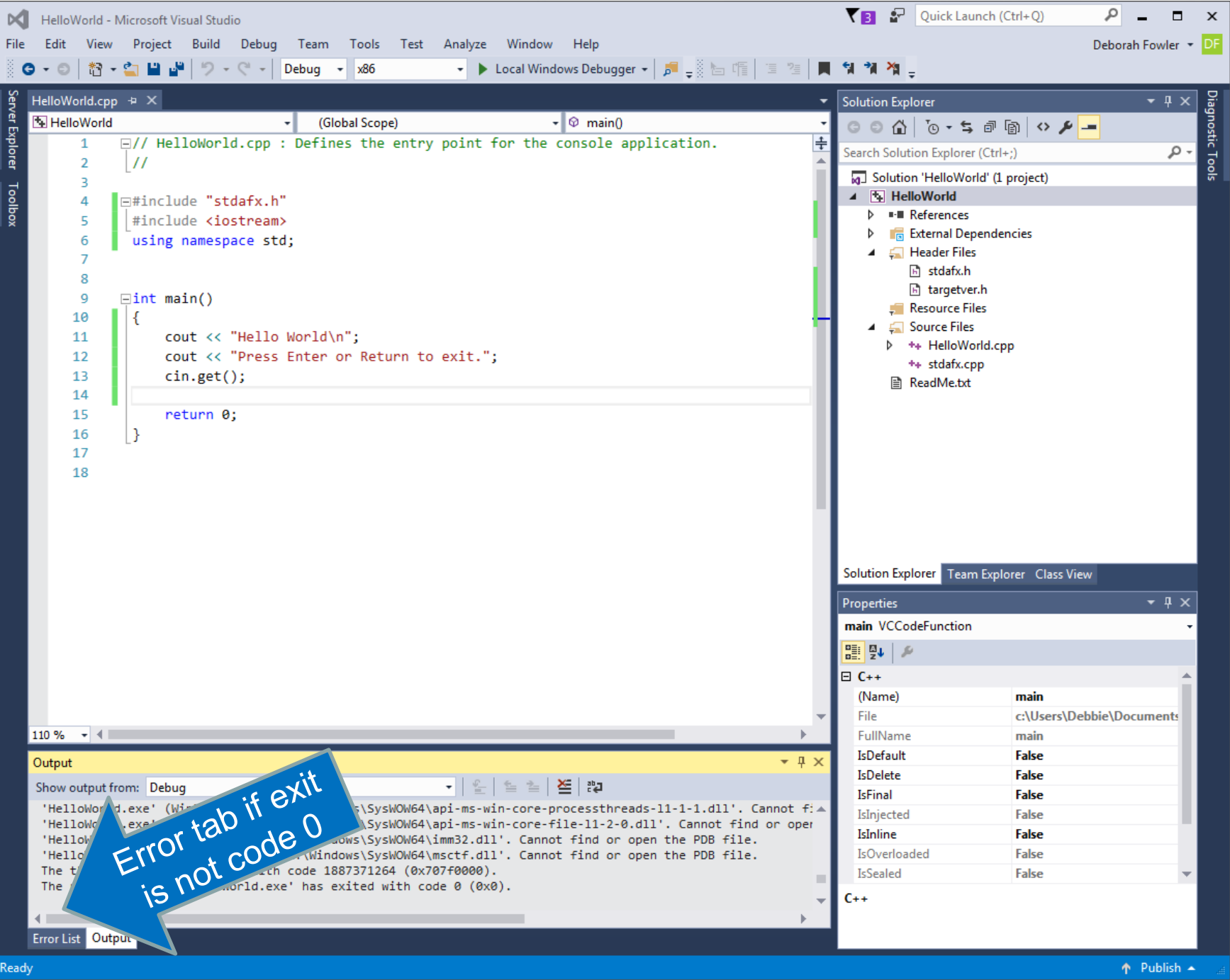


```
Microsoft Visual Studio
HelloWorld - Microsoft Visual Studio
File Edit View Project Build Debug Team Tools Test Analyze Window Help
Debug x86 Local Windows Debugger
HelloWorld.cpp
HelloWorld (Global Scope)
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6 using namespace std;
7
8
9 int main()
10 {
11     cout << "Hello World\n";
12     cout << "Press Enter or Return to exit.";
13     cin.get();
14
15     return 0;
16 }
17
18
```



Comments in C++ are  
//  
You may see older C-style /\* \*/  
Just like whitespace (tabs, spaces, newlines),  
ignored by the compiler, there to make code  
more readable





Error tab if exit is not code 0



HelloWorld - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Test Analyze Window Help

Deborah Fowler DF

Debug x86 Local Windows Debugger

Server Explorer Toolbox

Diagnostic Tools

```
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6 using namespace std
7
8
9 int main()
10 {
11     cout << "Hello World\n";
12     cout << "Press Enter or Return to exit.";
13     cin.get();
14
15     return 0;
16 }
17
18
```

Solution Explorer

Solution 'HelloWorld' (1 project)

- References
- External Dependencies
- Header Files
  - stdafx.h
  - targetver.h
- Resource Files
- Source Files
  - HelloWorld.cpp
  - stdafx.cpp
  - ReadMe.txt

Solution Explorer Team Explorer Class View

Properties

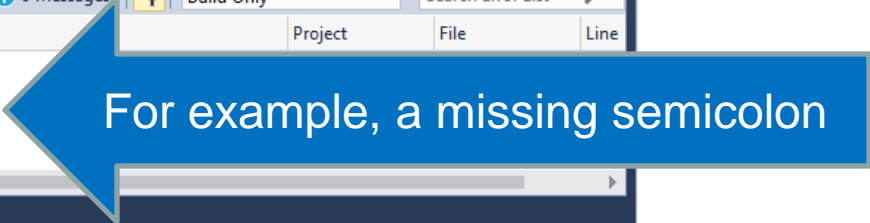
Error List

Entire Solution 1 Error 0 Warnings 0 Messages Build Only Search Error List

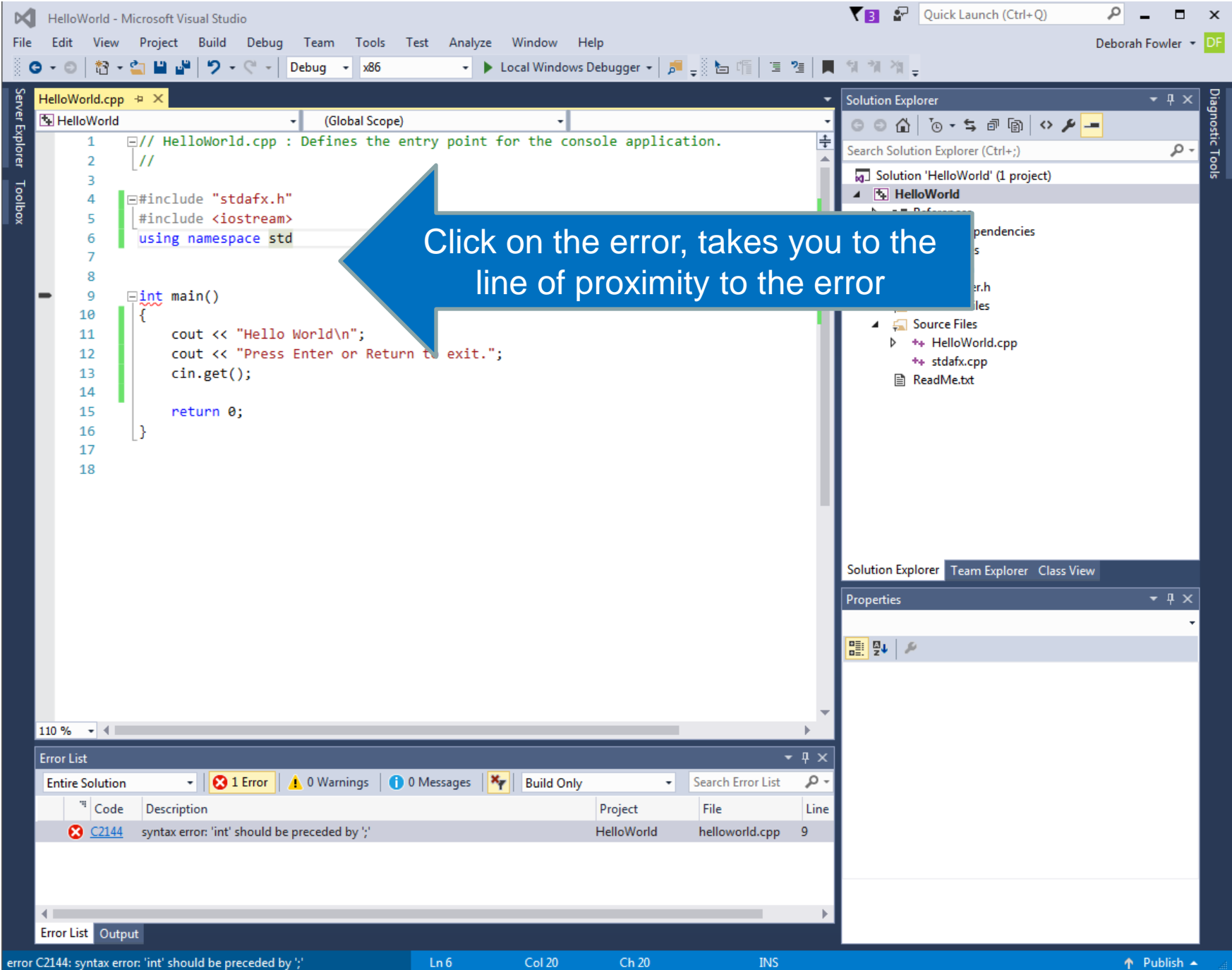
Code	Description	Project	File	Line
C2144	syntax error: 'int' should be preceded by ';'			

Build failed

Publish



For example, a missing semicolon



Microsoft Visual Studio interface showing a C++ program named HelloWorld.cpp. The code defines the entry point for a console application. A large blue arrow points to the code with the text "Fix the first error – compile or run again – success!". A console window in the foreground shows the output of the program: "Hello World" and "Press Enter or Return to exit.".

```
1 // HelloWorld.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6 using namespace std;
7
8
9 int main()
10 {
11     cout << "Hello World\n";
12     cout << "Press Enter or Return to exit.";
13     cin.get();
14
15     return 0;
16 }
17
18
```

Fix the first error – compile or run again – success!

c:\users\debbie\documents\visual studio 2015\Projects\HelloWorld\Debug\HelloWorld.exe

```
Hello World
Press Enter or Return to exit.
```

Name	Value
Autos	

Autos Locals Watch 1

Call Stack Breakpoints Exception Settings Command Window Immediate Window Output

Ready Ln 6 Col 21 Ch 21 INS Publish

Congratulations! You have written a  
successful C++ program using Visual  
Studios 2015