

CS2311 – Lab 6

- Debug a Program with Visual Studio
2013/2015
- *Semester A 2016-17*

Debugger

- What is a debugger?
 - A tool for programmer to
 - Trace the execution path of a program
 - Step through the code line by line and investigate the value of variables at each step
- When you need a debugger?
 - When a program does not act as the programmer expected, the debugger can help to find out the logical bug

Outlines

- In this tutorial you will learn how to
 1. Trace a program
 2. Display the value of variable
- Finish the exercise 1, 2 and 3

Tutorial Exercise

- Debug a sample program (debug1.cpp)
- Steps:
 1. Create a new project in visual studio
 2. Download the debug1.cpp from backboard and save it to the project folder
 3. In visual studio, add an existing item to the project

Create a new project

◆ Solution 'debugger' (1 project)
◆ F:\ debugger
/ijl External Dependencies
H..der Files
Resource
Files Source
Files.J

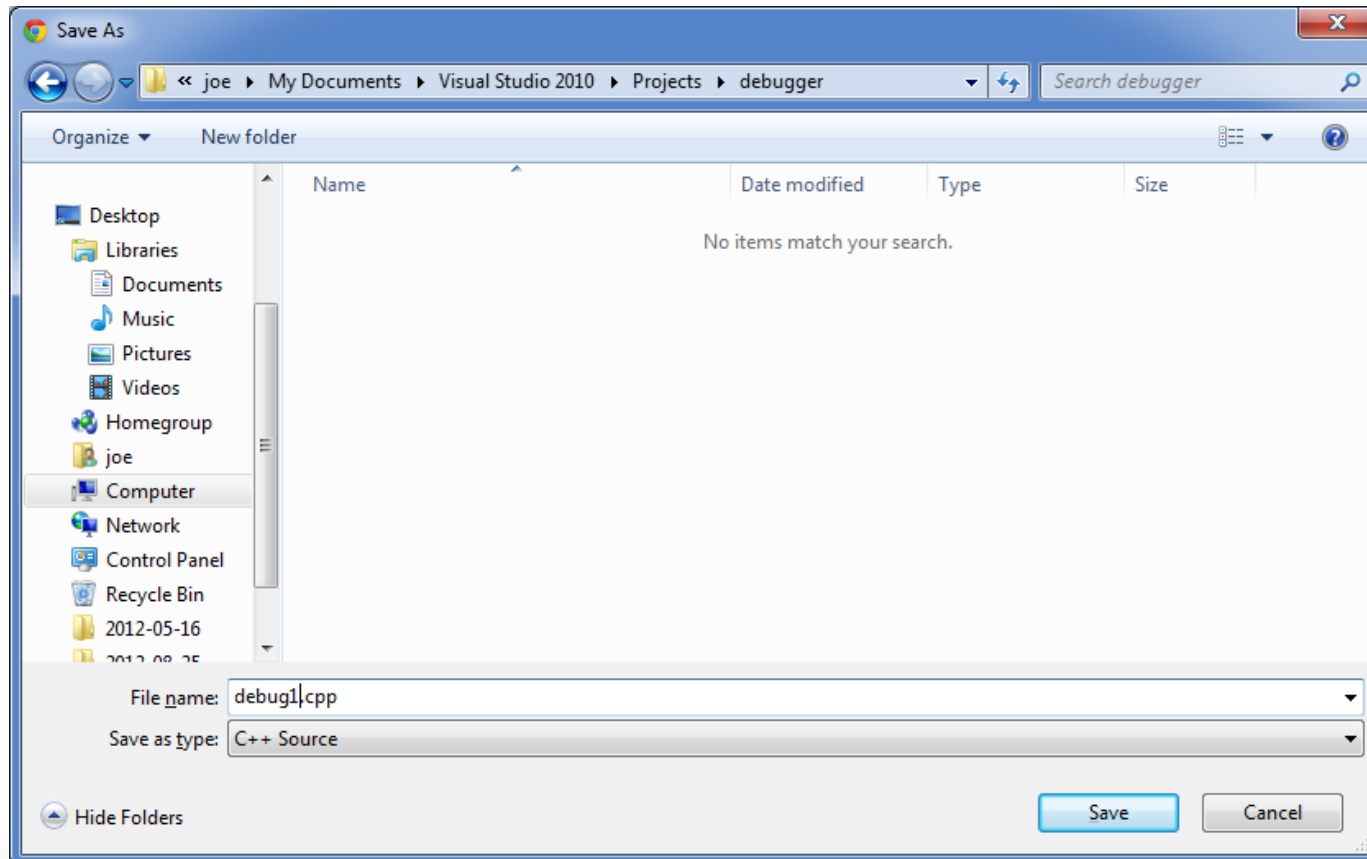
Download the sample program



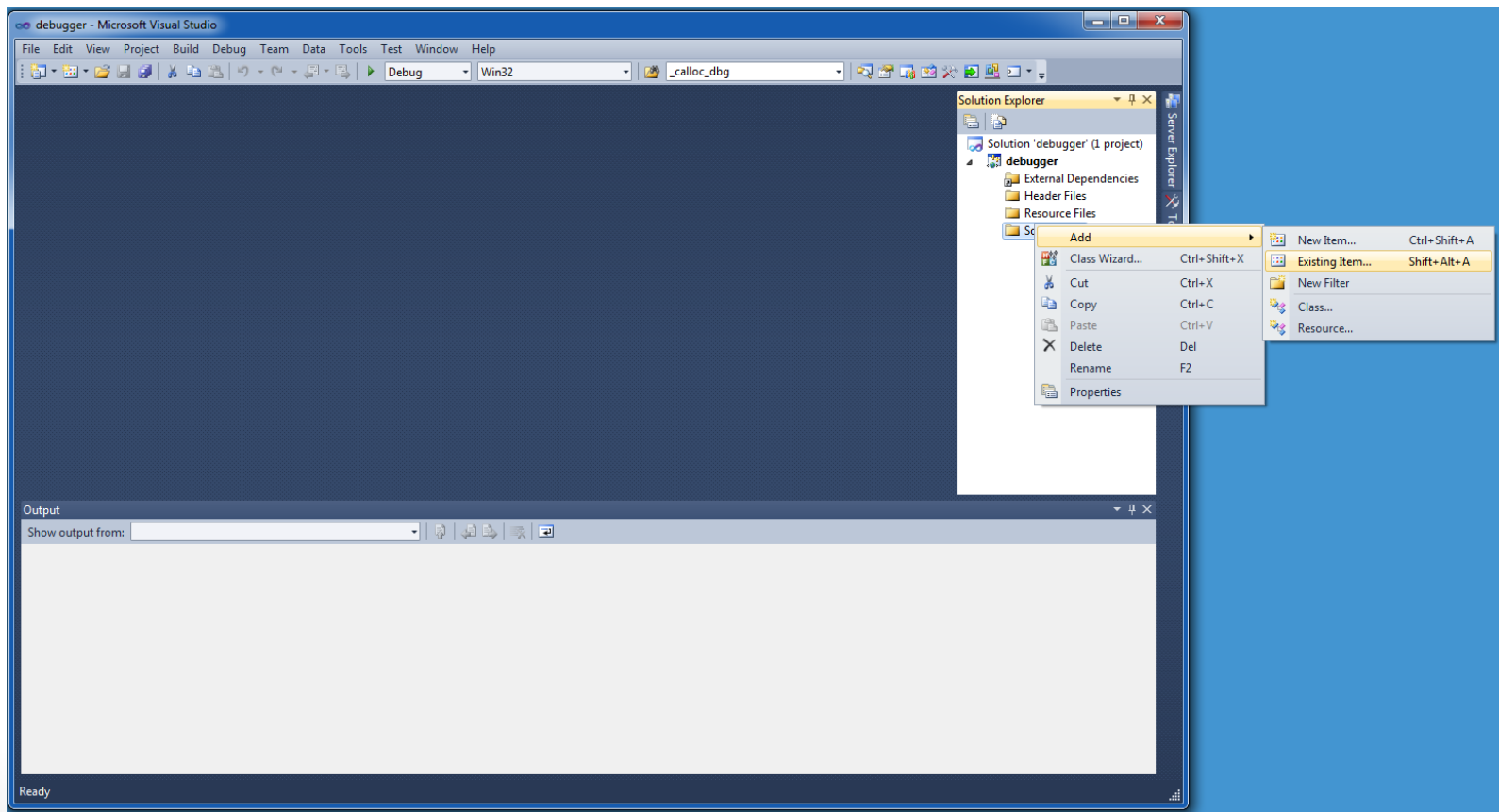
Tutorial 6 Debugger

Availability: Item is not available.

Attached Files: [debug1.cpp](#) (0.1 KB) [debug2.cpp](#) (0.244 KB) [nested-for.cpp](#) (0.288 KB) [sumArray.cpp](#) (0.229 KB) [cToF.cpp](#) (0.312 KB)



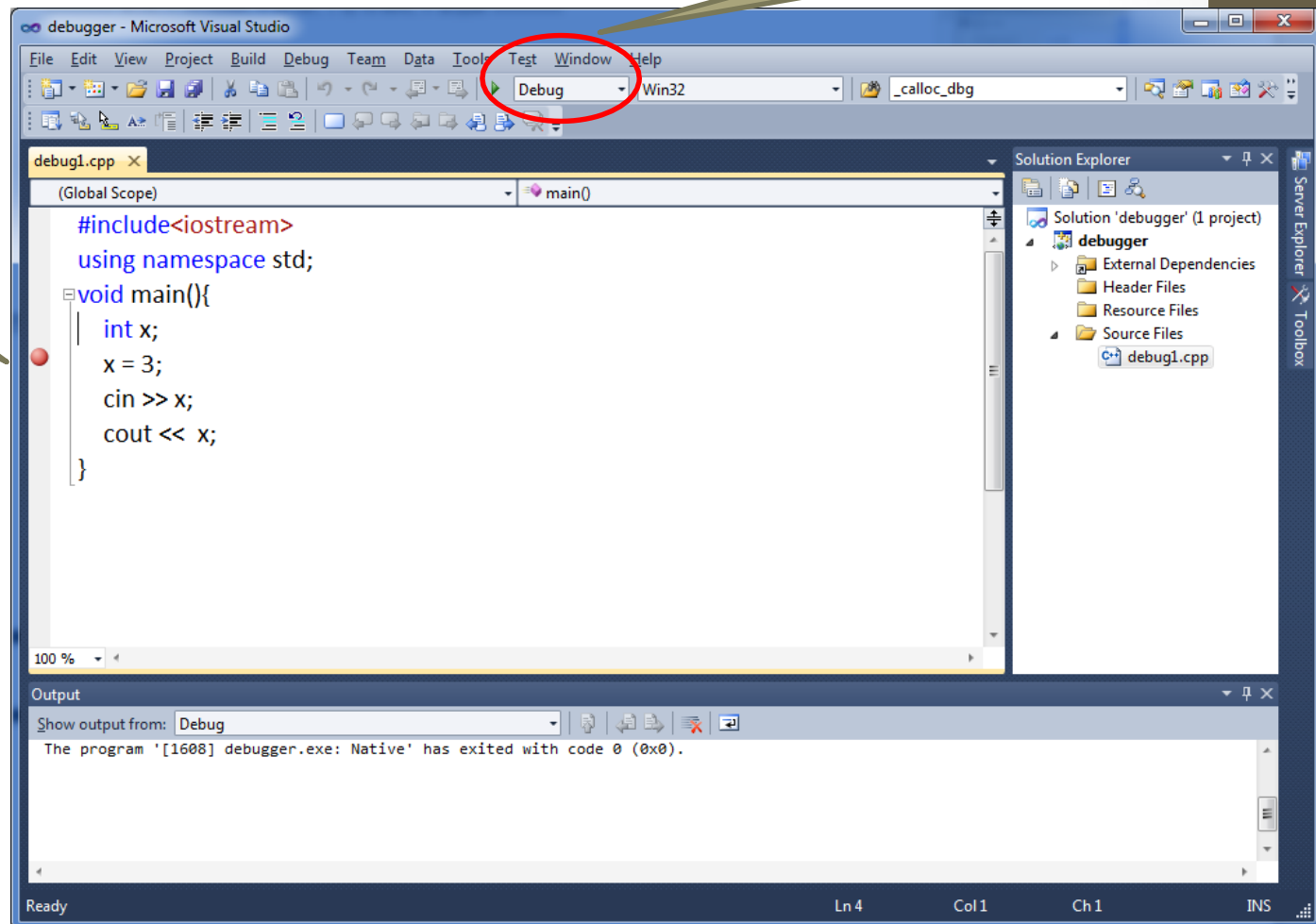
Add the sample program to the project



Set a breakpoint

Click here to
add a
breakpoint at
line 5

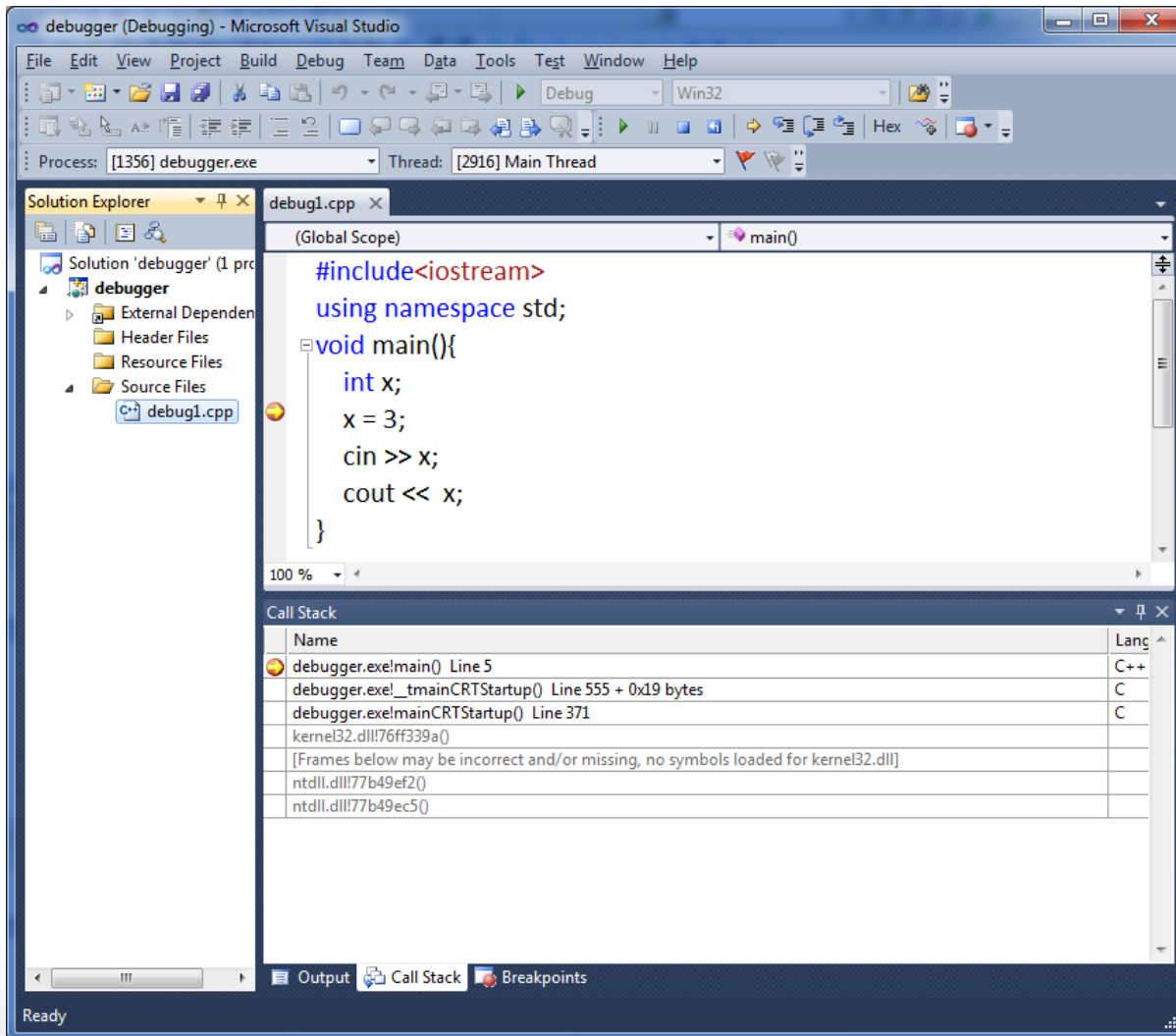
Make sure the project is in
debug mode



Steps to invoke the debugger

- Rebuild the solution
 - Build -> Rebuild Solution (Ctrl + Alt + F7)
- Start the debugger
 - Debug -> Start Debugging (F5)
- The program execution should stop at the line “x=3”

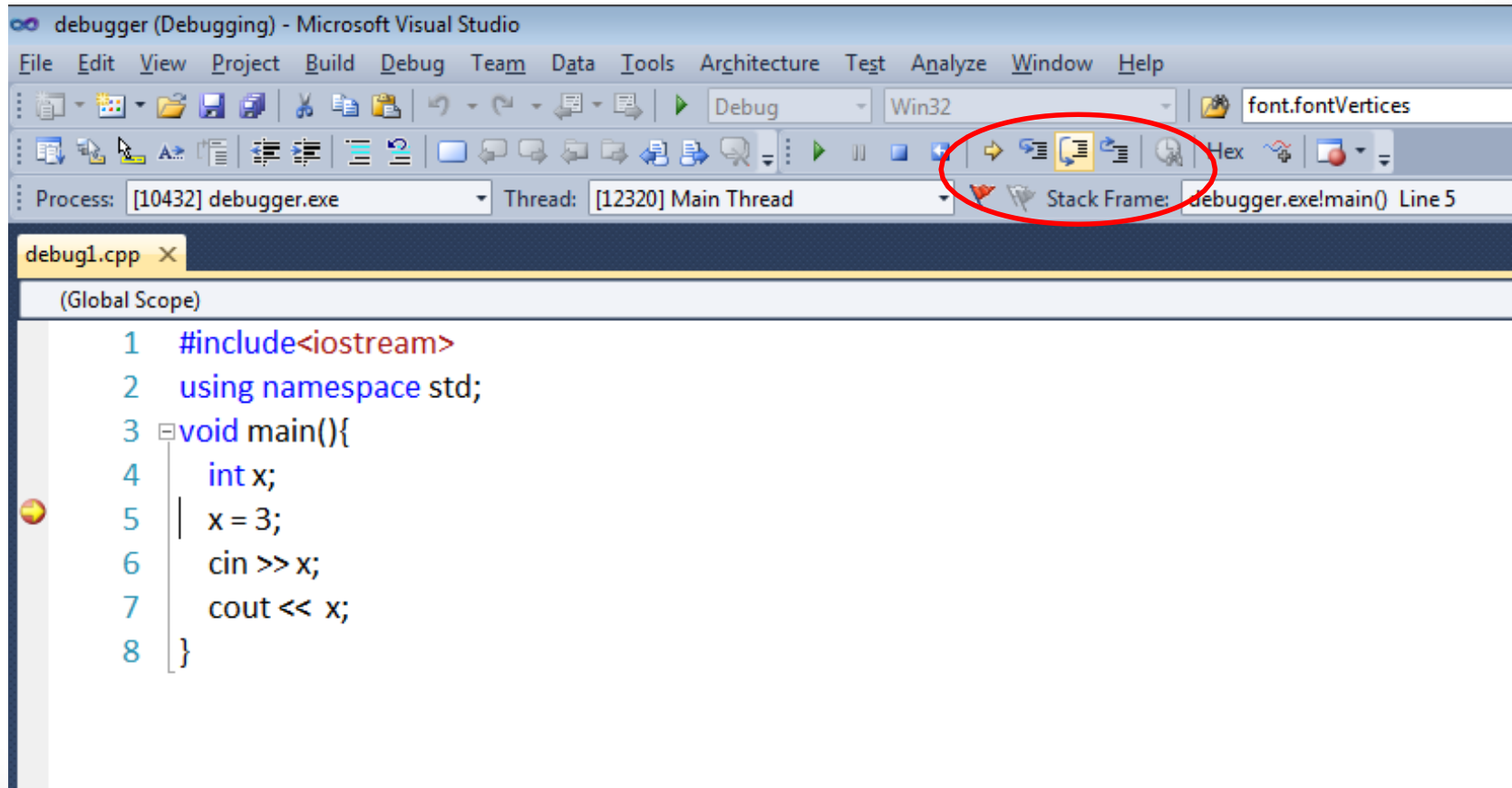
Execution stop at x=3



Step through a program

- Step over (F10):
 - execute the current statement and stop at the next statement.
 - If the current statement is a function call, the function will be called.
- Step Into (F11):
 - If the current statement is a function call, go inside the function body and stop at the first statement.
- Step out (Shift+F11):
 - Finish the execution of current function and stop at the point where the function is called.

Step over, Step into, Step out on toolbar



Summary of short-cut key

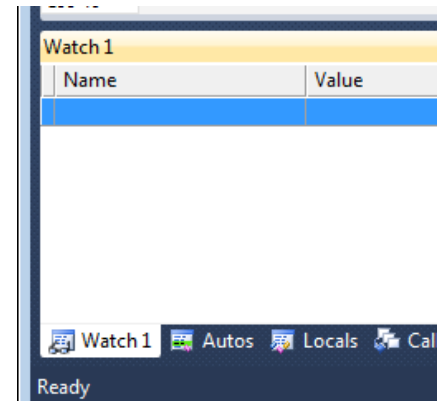
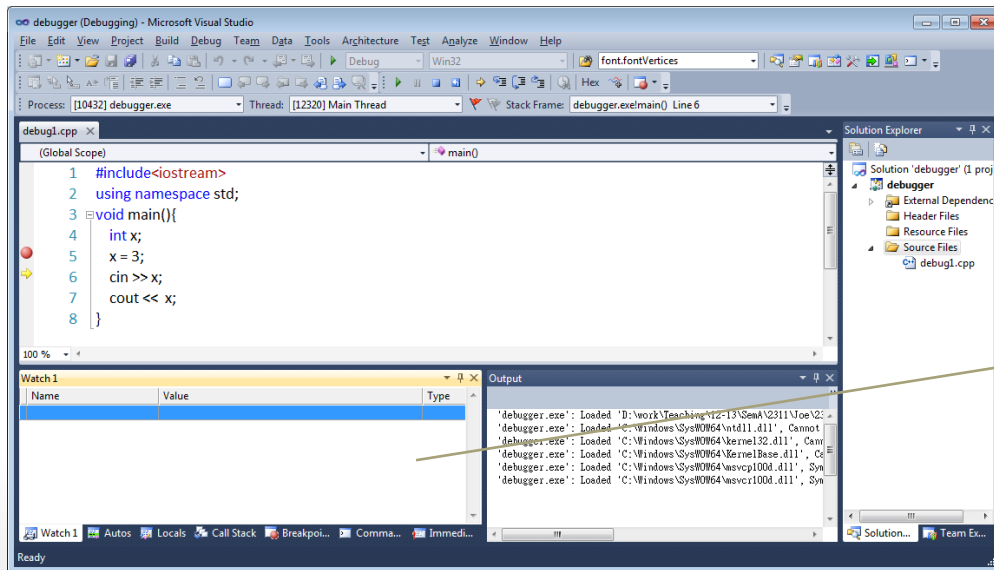
Key	Function
Ctrl+alt+F7	Rebuild the solution
F5	Start debugging
Ctrl+F5	Start without debugging
Shift+F5	Stop debugging
F10	Step over
F11	Step into
Shift + F11	Step out

Exercise 1

- Download the debug2.cp
- Use step over, step into and step out to trace the program

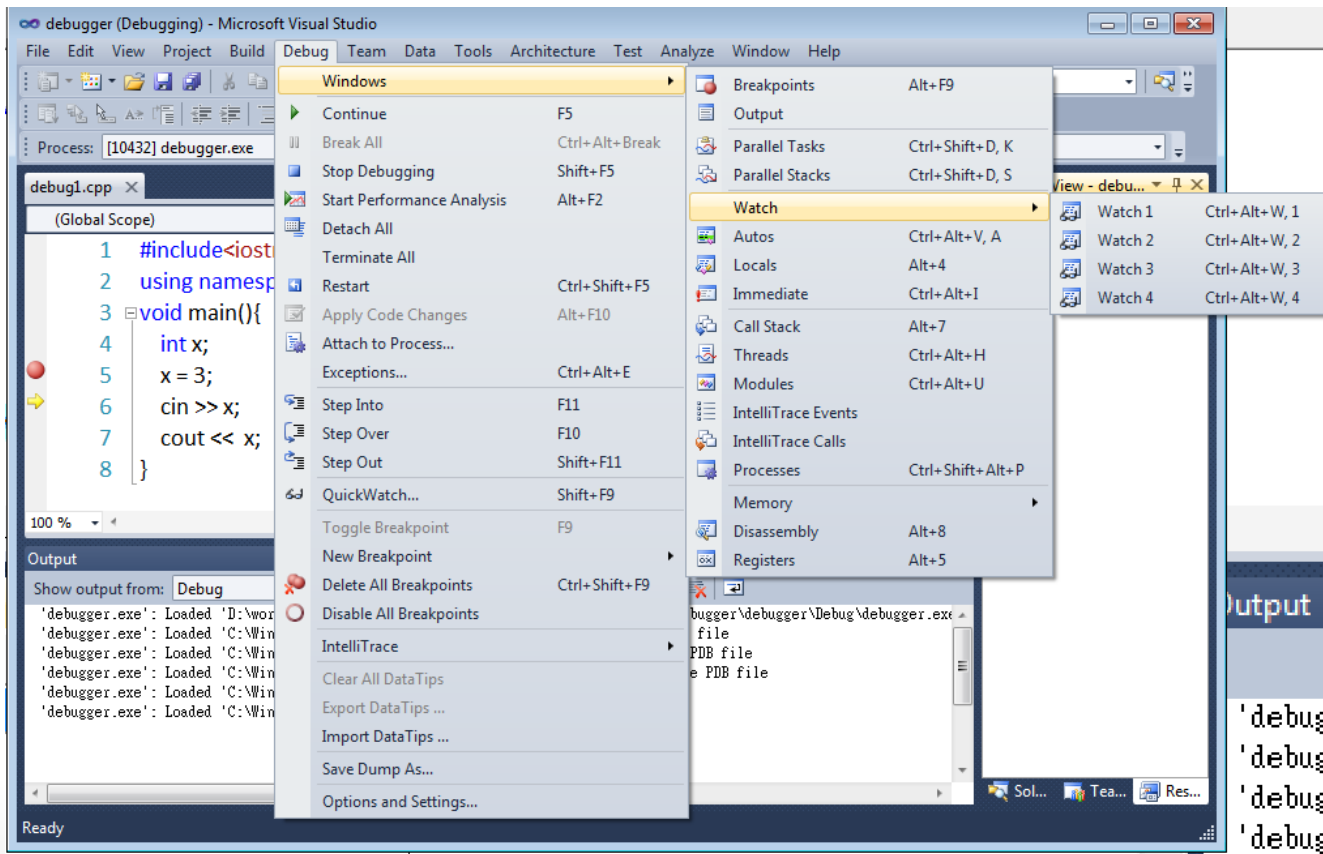
Display the value of a variable

- Value of variable can be found in
 - Auto :display related variables (selected by VS)
 - Local :display local variable only
 - Watch1..N : display user selected variable



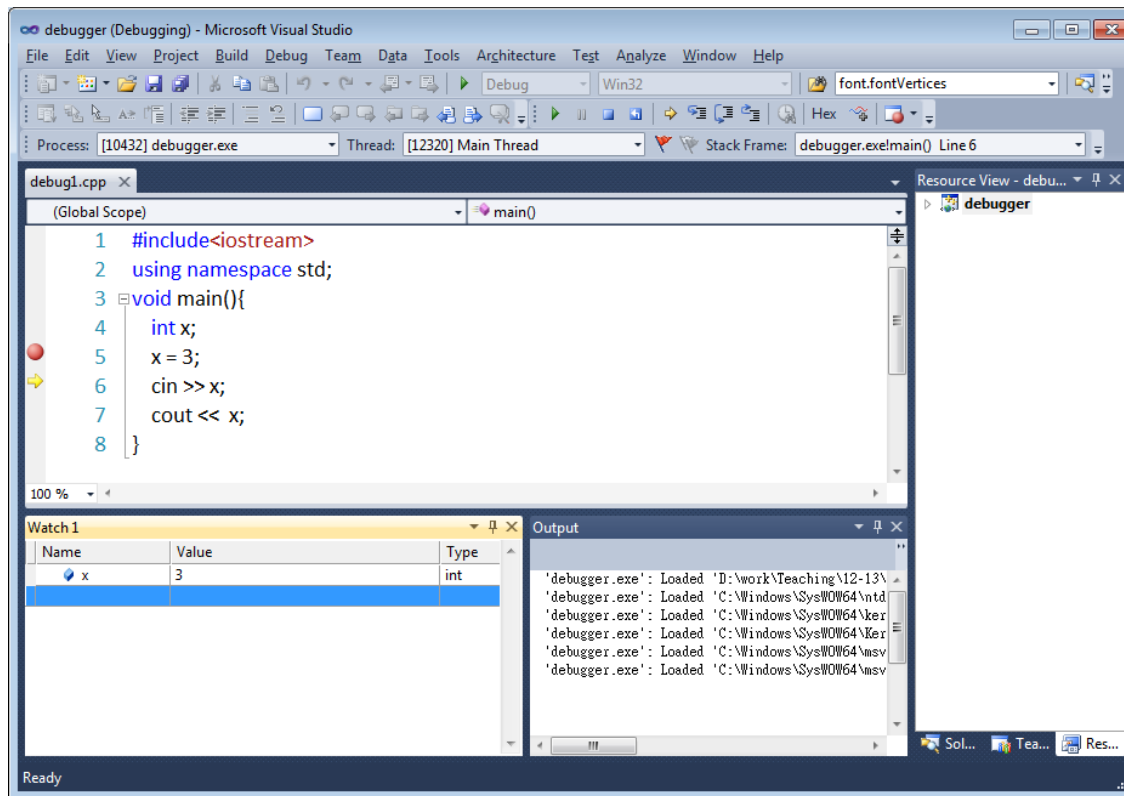
If you can't find the watch windows....

- Watch, Autos and locals window can be found at “Debug”->”Windows”



Add a variable to Watch

- Enter the variable in watch1 window to display a particular variable



Exercise 2

- Download the program cToF.cpp
- The program accepts a real number in Fahrenheit (F) and output the temperature in Celsius®, where $C = (F - 32) * 5/9$.
- Compile and execute the program.
- Type 100 as the input
- Notice that the output of the program is not correct and the program contains logical errors.
- Try to locate and debug the program using the VS debugger
- Hint: what is the value of 5/9?

Exercise 3

- Download nested-for.cpp and run inside a debugger to trace the execution of the program

Exercise 4

- Do this question after you have learnt the topic on arrays
- Download `sumArray.c`, correct the logical errors in the program with the use of the debugger