

CSC 1101 – Problem Solving and Programming Laboratory

Warmup Lab 2 (not graded)

1-Canvas

This section has you download and save two files in your storage space:

WarmupLab02.cpp

CSC1101-DanO-WarmupLab02b.docx

- 1) Open the Canvas web site for CSC 1100.
- 2) Select Canvas item **Assignments / Warmup Lab 2**.
- 3) Click link **WarmupLab02.cpp**.
- 4) Move the file from your **Downloads** folder to your **CSC 1101 / Lab Code** folder.
- 5) Select Canvas item **Assignments / Warmup Lab 2**.
- 6) Click link **CSC1101-DanO-WarmupLab02b.docx**.
- 7) Move the file from your **Downloads** folder to your **CSC 1101 / Labs** folder.

2-Visual Studio

This section has you create a C++ console application project, add code to it, edit the code, run the program, and save the program code and output in your lab assignment document (CSC1101-DanO-WarmupLab02b.docx).

- 1) Open Visual Studio.
- 2) Close any open solution by clicking **File / Close Solution**.
- 3) Create a Visual C++ CLR console application:
 - 1) From the Visual Studio screen, select **File / New / Project ...**
 - 2) From the New Project screen:
 - a) Select **Visual C++ / CLR / CLR Empty Project**.
 - b) For Name, enter **WarmupLab2** (leave Solution Name the same).
 - c) For Location, click **Browse ...**, navigate to your folder **CSC 1101 / Projects**, and click **Select Folder**.
 - d) Click **OK**.

It may take a few minutes to create the project.

DanO

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4) Add starting code to the project:

- 1) From the Visual Studio project screen, Solution Explorer pane, right-click **Source Files**, and select **Add / Existing Item ...**
- 2) From the Add Existing Item screen, navigate to file **WarmupLab02.cpp** (downloaded from Canvas), and click **Add**.

5) Edit the header comment per the following code. Replace <name> with your name, and <date> with today's date:

```
//=====
//
// Title:      Warmup Lab 2
// Course:     CSC 1101
// Lab Number: Warmup Lab 2
// Author:     <name>
// Date:       <date>
// Description:
//   This C++ program is based on the code template for CSC
// 1101.  It had errors in it that I fixed (yay me).
//
//=====
```

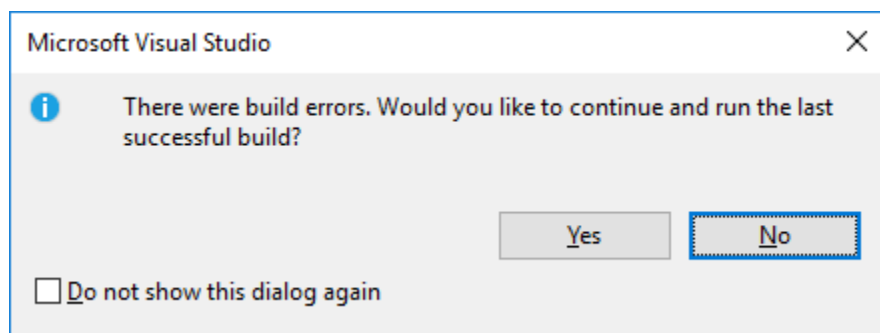
macOS users: you may have to edit/remove one or more of the following statements:

```
#include <conio.h> // For function getch()
#include <cstdlib> // For several general-purpose functions
#include <fstream> // For file handling
#include <iomanip> // For formatted output
#include <iostream> // For cin, cout, and system
#include <string> // For string data type
...
cout << "Press any key to exit ..." << endl;
_getch();
```

6) Run the program by clicking **Local Windows Debugger**. If the following dialog appears, select **Do not show this dialog again**, and then click **No**. This will save you time in the future! We never want to build an application with errors!

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The program has errors. These are listed in pane Error List.

7) Double-click the first error. This moves the cursor to where Visual Studio thinks the error is. Data type **int** is misspelled as **in**. Change line:

```
in i;
```

to

```
int i;
```

Run the program by clicking **Local Windows Debugger**.

8) Double-click the first error. This moves the cursor to where Visual Studio thinks the error is. The error is actually in the previous line. A semicolon is missing from the end of the statement. Change line:

```
cout << "-----" << endl << endl
```

to

```
cout << "-----" << endl << endl;
```

Run the program by clicking **Local Windows Debugger**.

9) Double-click the first error. This moves the cursor to where Visual Studio thinks the error is. Instead of an insertion operator (>>), there should be an extraction operator (<<). Change line:

```
cout << "\nEnd of my Application" << endl >> endl;
```

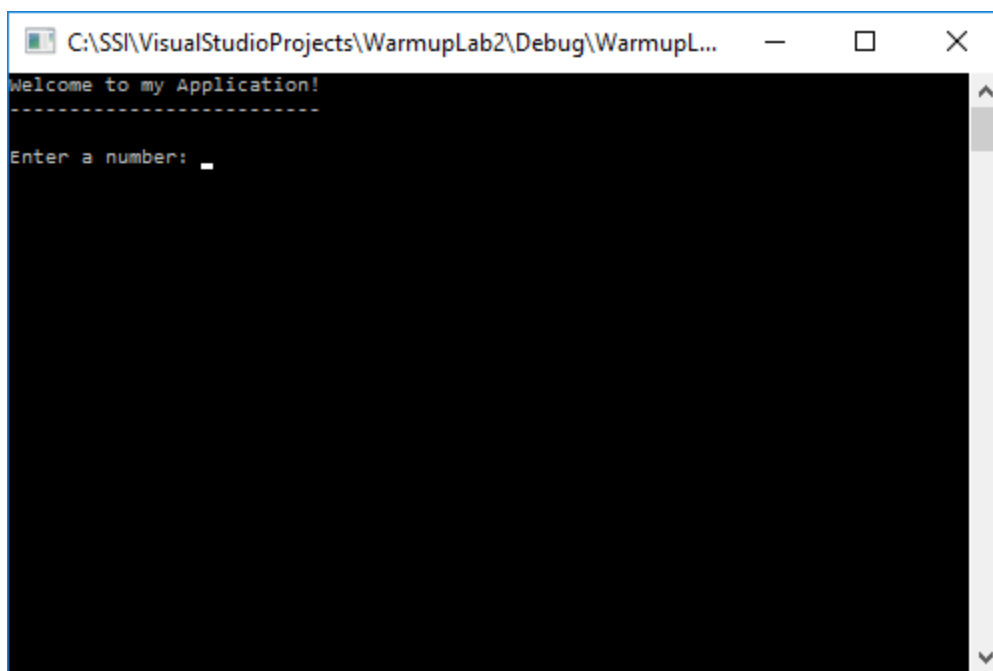
to

```
cout << "\nEnd of my Application" << endl << endl;
```

Note that one edit can remove multiple errors. Run the program by clicking **Local Windows Debugger**. It may take a few minutes to run the program the first time. The following screen appears:

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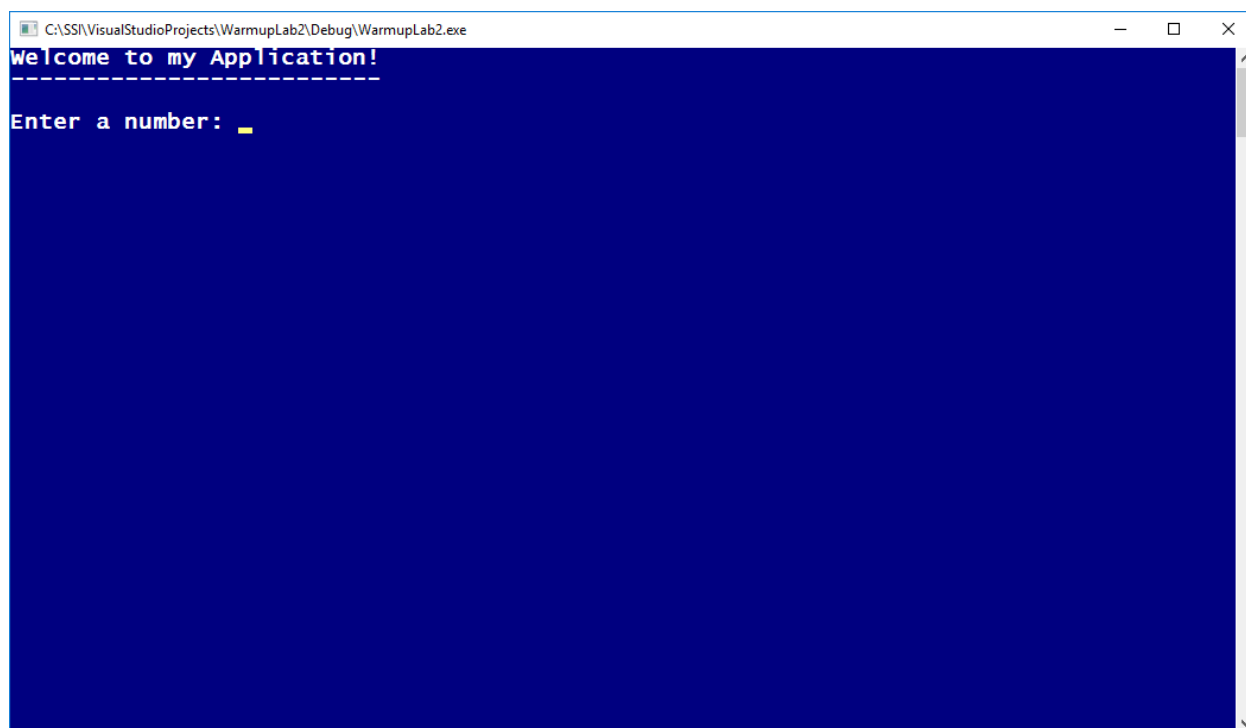
10) Change the font, layout, and colors of the console window:

- 1) From the console window, right-click the title bar, and click **Properties**.
- 2) From the console properties screen, click tab **Font**. Make any desired changes to the font settings.
- 3) From the console properties screen, click tab **Layout**. Make any desired changes to the **Window Size** settings.
- 4) From the console properties screen, click tab **Colors**. Set the colors so that there is good contrast between the screen text and background. Set the **Screen Text** to a dark/light color, and the **Screen Background** to a light/dark color.
- 5) From the console properties screen, click **OK**.

Here is one possible console window configuration:

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- 11) From the program screen and prompt “Enter a number: “, enter an integer and press ENTER.
- 12) End the program by pressing any key.
- 13) Open your lab assignment document **CSC 1101 / Labs / CSC1101-DanO-WarmupLab02b.docx**.
- 14) Copy-and-paste the *program code* to your lab assignment document:
 - 1) Click anywhere within the program.
 - 2) Press **CTRL-A** (select all) and then press **CTRL-C** (copy).
 - 3) Within the document, locate the line:
[your program code here]
 - 4) Just after that line, press **CTRL-V** (paste).
- 15) Copy-and-paste the *program output* to your lab assignment document:
 - 1) From the Visual Studio project screen, click **Local Windows Debugger**.
 - 2) From the program screen and prompt “Enter a number: “, enter an integer and press ENTER.
 - 3) From the output window, press **ALT-PrintScreen** (copy active window).
 - 4) End the program by pressing any key.
 - 5) Within the document, locate the line:

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[your program output here]

6) Just after that line, press **CTRL-V** (paste).

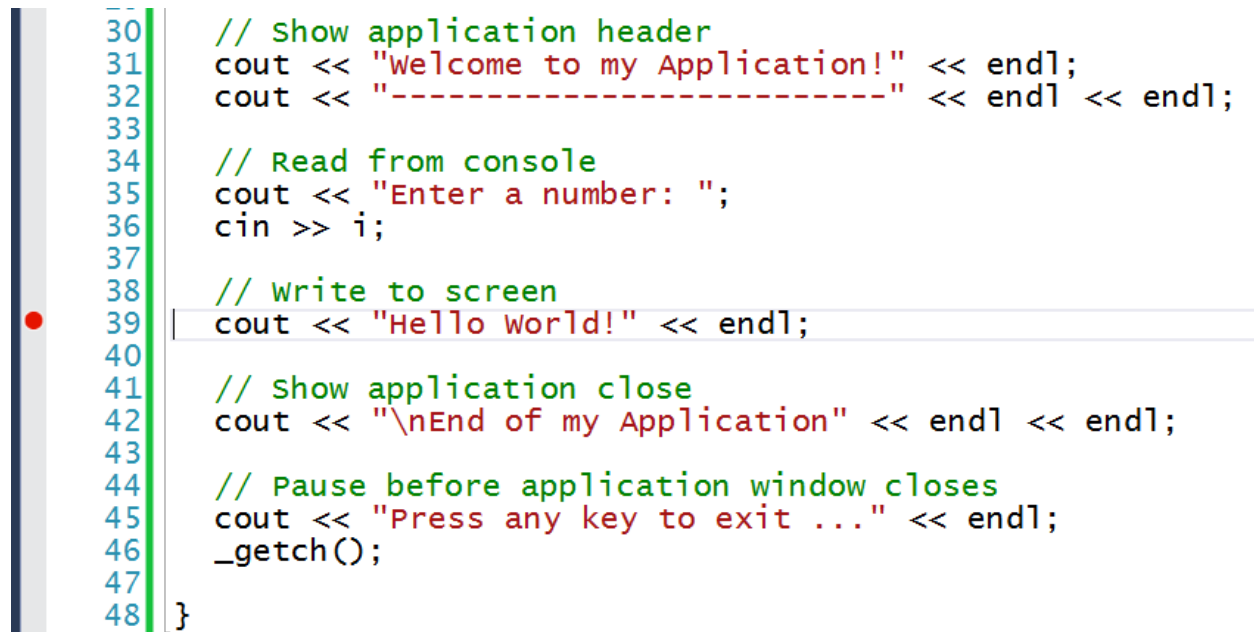
16) Save and close your lab assignment document.

17) Set a breakpoint in the program:

From the Visual Studio project screen, click in the gray margin of line:

```
cout << "Hello World!" << endl;
```

This sets a breakpoint (indicated by the red dot) which will stop program execution at that line when the Visual Studio debugger is running.



```

30 // show application header
31 cout << "welcome to my Application!" << endl;
32 cout << "-----" << endl << endl;
33
34 // Read from console
35 cout << "Enter a number: ";
36 cin >> i;
37
38 // write to screen
39 cout << "Hello world!" << endl;
40
41 // show application close
42 cout << "\nEnd of my Application" << endl << endl;
43
44 // Pause before application window closes
45 cout << "Press any key to exit ..." << endl;
46 _getch();
47
48 }

```

18) Run the program by clicking **Local Windows Debugger**.

19) From the program screen and prompt “Enter a number: “, enter an integer and press ENTER.

20) Navigate to the Visual Studio window, if necessary. Note that program execution has stopped at the breakpoint (indicated by the red dot now with a yellow arrow inside of it). Pane Locals shows the current value of each variable (r, c, s, and i). The debugger is a useful tool for investigating run-time and logic errors in your program.

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The screenshot shows a Visual Studio IDE with a C++ program. The code is as follows:

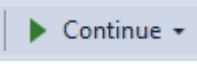
```

30 // Show application header
31 cout << "welcome to my Application!" << endl;
32 cout << "-----" << endl << endl;
33
34 // Read from console
35 cout << "Enter a number: ";
36 cin >> i;
37
38 // Write to screen
39 cout << "Hello World!" << endl;
40
41 // Show application close
42 cout << "\nEnd of my Application" << endl << endl;
43
44 // Pause before application window closes
45 cout << "Press any key to exit ..." << endl;
46 _getch();
47
48 }

```

Below the code editor is the 'Locals' window, which displays the current state of variables:

Name	Value	Type
r	0.000000000000000000	double
c	0	char
s	[...]	std::basic_string<char, std::char_traits<char>, std::allocator<char> >
i	44	int

21) Click **Continue**  to resume program execution.

22) End the program by pressing any key.

23) Remove a breakpoint from the program:

From the Visual Studio project screen, click the red dot in the gray margin of line:

```
cout << "Hello World!" << endl;
```

24) Close Visual Studio.

3-Canvas

This section has you submit your lab assignment document (CSC1101-DanO-WarmupLab02b.docx) to your TA for grading (but this one won't be graded).

- 1) Open the Canvas web site for CSC 1100. For graded labs starting September 11, you will open the Canvas web site for CSC 1101.
- 2) Select Canvas item **Assignments / Warmup Lab 2**.
- 3) Click **Submit Assignment** (or **Re-submit Assignment**).

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4) Click **Choose File**, navigate to and select document **CSC1101-DanO-WarmupLab02b.docx**, check on the original work check box, and click **Submit Assignment**.