

# LAB 2 DEBUGGING DOCUMENT

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## PART 1: DEBUG A GIVEN PROGRAM

This guide will walk you through the steps of iterative debugging. Use this document to track errors, solutions, and screenshots of your work. Please follow the instructions in this document to track your errors, document your solutions, answer questions, and paste screenshots in this document as instructed. **You will be uploading this completed document with your submission for this lab assignment.**

### STEP 1: WHAT IS THE PROGRAM SUPPOSED TO DO?

Write down the overall goal of the given **lab2a.cpp** program and the steps it should take to achieve that goal.

**Note:** The **sample output** of the corrected version of lab2a.cpp was provided in **Part 1** of the **Spring 2025 Lab 2 Assignment** document.

The program should ... ask for your first letter of your name and ask for your birthday in MMDD and using that will create a agent name.

### STEP 2: COMPILE AND RUN THE PROGRAM

Record the observed behavior and output. Include a screenshot of the output here:

**Screenshot 1:** *(Paste screenshot)*

```
PS C:\Users\WaiLac\OneDrive\Documents\CSC1300\ Labs\Lab2>
History restored
PS C:\Users\WaiLac\OneDrive\Documents\CSC1300\ Labs\Lab2> g++ lab2.cpp
lab2.cpp: In function 'int main()':
lab2.cpp:14:5: error: expected initializer before 'int'
   14 |     int random_word;
      |     ^~~~~
lab2.cpp:17:5: error: 'cout' was not declared in this scope; did you mean 'std::cout'?
   17 |     cout << "Welcome to the VSA (Very Secret Agency).\n";
      |     ^~~~~
      |     std::cout
In file included from lab2.cpp:9:
C:/mingw64/include/c++/14.2.0/iostream:63:18: note: 'std::cout' declared here
   63 |     extern ostream cout;          ///< Linked to standard output
      |
lab2.cpp:22:5: error: 'cin' was not declared in this scope; did you mean 'std::cin'?
   22 |     cin >> letter;
      |     ^~~
      |     std::cin
C:/mingw64/include/c++/14.2.0/iostream:62:18: note: 'std::cin' declared here
   62 |     extern istream cin;          ///< Linked to standard input
      |
lab2.cpp:22:12: error: 'letter' was not declared in this scope
   22 |     cin >> letter;
      |            ^~~~~~
lab2.cpp:25:12: error: 'birthday' was not declared in this scope
   25 |     cin >> birthday;
      |            ^~~~~~
lab2.cpp:28:5: error: 'agent_number' was not declared in this scope
   28 |     agent_number = (birthday / letter) * 100 + (letter % 10);
      |     ^~~~~~~~~~
lab2.cpp:31:43: error: 'random_word' was not declared in this scope
   31 |     cin << "Your new spy name is now " << random_word << agent_number;
      |                                           ^~~~~~
lab2.cpp:33:14: error: expected '}' at end of input
   33 |     return 0;
      |
lab2.cpp:11:12: note: to match this '{'
   11 | int main() {
      |
PS C:\Users\WaiLac\OneDrive\Documents\CSC1300\ Labs\Lab2>
```

### STEP 3: DOCUMENT & FIX SYNTAX ERRORS

**Note:** Debugging is an iterative process; it's normal to encounter new issues as you fix others. Don't hesitate to ask peers or instructors for help if you're stuck.

For each syntax error:

1. **Locate the error:**

- Document any compilation errors.
- Read the error message and identify the line number.
- Look for red squiggles or warnings in your code editor.

2. **Understand the error:**

- Hover over the error message or search online to understand what it means.
- Document the meaning of the error here:

**Error Explanation:** *random\_word needs to be a char variable, need to create a var for agent\_number , needs "}" at end, need to make a cout and cin for random\_word, cout uses wrong "<<",*

**Fix the error:**

- Implement a solution and recompile the program.
- Record whether the error went away.

3. Repeat until all syntax errors are resolved, adding a new Error Explanation and screenshot for each error you fix.

**Screenshot 2:** *(Paste updated screenshot)*

### STEP 4: ADDRESS LOGIC ERRORS

If the program runs but the output is incorrect:

1. **Identify the problem:**

- a. Compare the program's actual output to the expected output.
- b. Describe what the program is doing versus what it should be doing.

2. **Observed Behavior:** *Didn't have a space in between name and number*

3. **Expected Behavior:** *Needs space in between*

4. **Test individual sections:**

- a. Use print/cout statements or a debugger to isolate which part of the code is not working as intended.

5. **Locate and fix the error:**

- a. Analyze the problematic section.
- b. Document the issue and your solution:

6. **Logic Error:** *(Describe the issue)*

7. **Solution:** *(Describe the fix)*

8. **Re-run the program:**

- a. Test whether your fix resolved the issue.
- b. If not, repeat this step. **Do not** delete your previous responses or screenshot, just add to them with the new bug and new solution.

**Screenshot 3:** *(Paste screenshot)*

## STEP 5: ITERATE UNTIL CORRECT

1. **Continue debugging:**

- a. Repeat each debugging process until the program runs correctly and produces the desired output.

2. **Document additional issues and fixes:**

- a. Use the template from Steps 3 and 4 to track any new errors introduced during debugging.

3. **Final Output:**

- a. Paste a screenshot of the final, correct output below:

**Screenshot 4:** *(Paste final screenshot)*

## PART 2: PRACTICE ON YOUR OWN

First, go back to the **Spring 2025 Lab 2 Assignment** document and read through **Part 2** assignment direction that guides you on creating **lab2b.cpp**. Then, come back to this document to answer the questions and provide screenshots while following the directions.

### STEP 1: DEFINE THE PROGRAM'S GOAL

**What is the program supposed to do?**

The program should be able to take two people's ages and favorite colors and tell what their compatibility is.

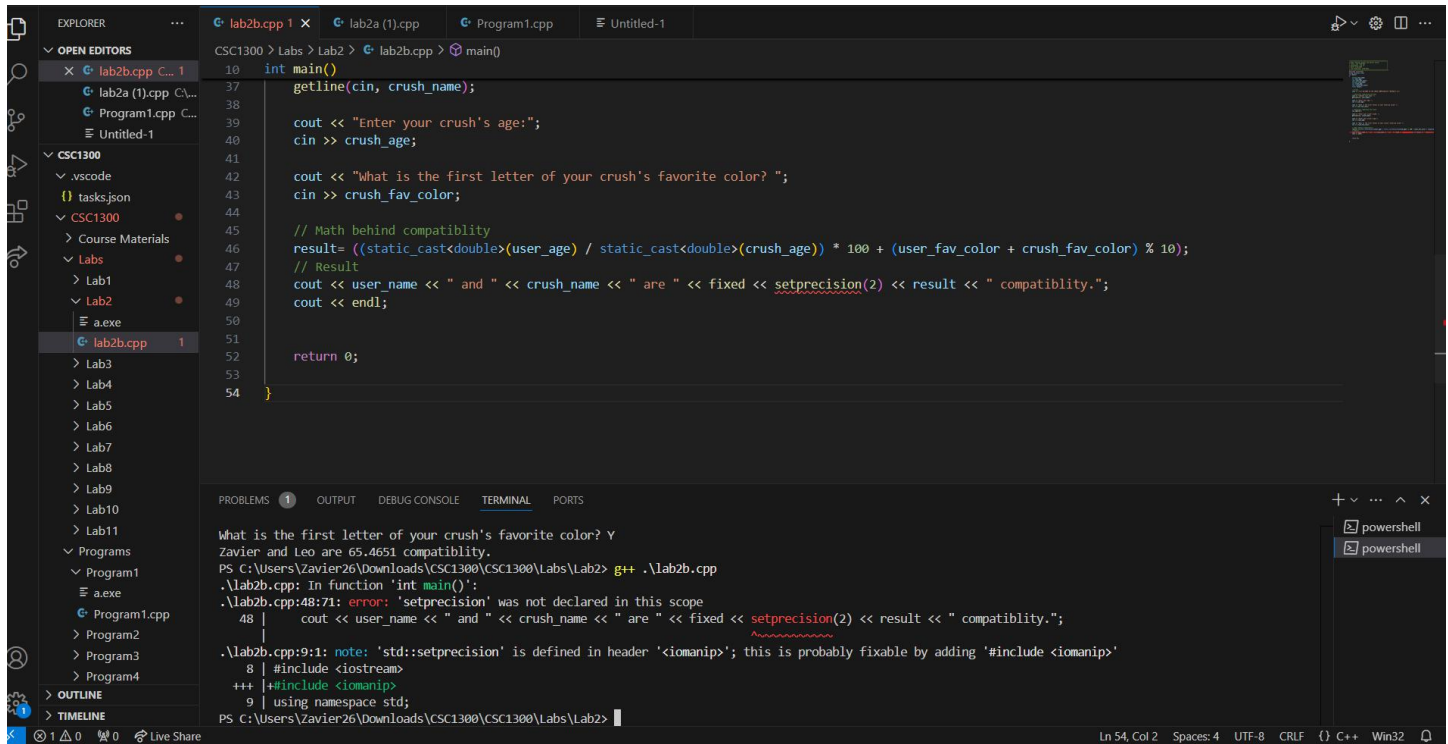
## STEP 2: RUN YOUR PROGRAM

### Compile and run the program.

You may do this step multiple times before the full program is finished; in fact, this is encouraged! This can help you catch bugs earlier on and helps you know which parts of your program are already working as intended.

Include a screenshot of the output here:

### Screenshot 5:



## STEP 3: FIX SYNTAX ERRORS

For each syntax error:

- Locate the error:**
  - Read the error message and identify the line number.
  - Look for red squiggles or warnings in your code editor.
- Understand the error:**
  - Hover over the error message or search online to understand what it means.
  - Document the meaning of the error here:
- Error Explanation:** I forgot to add in the `iomanip` library to be able to have `setprecision`
- Fix the error:**
  - Implement a solution and recompile the program.

- b. Record whether the error went away. (The Error did in fact disappear after adding the library)
5. **Repeat until all syntax errors are resolved**, adding a new Error Explanation and screenshot for each error you fix.

## Screenshot

6:

```

11  int main()
12
13  // Title (const char [52])"**** WELCOME TO THE CRUSH COMPATIBILITY TESTER*** \n"
14  cout << "**** WELCOME TO THE CRUSH COMPATIBILITY TESTER*** \n";
15
16  // Questions regarding the User
17  cout << "\nEnter your name: ";
18  getline(cin, user_name);
19
20  cout << "Enter your age: ";
21  cin >> user_age;
22
23  cout << "What is the first letter of your favorite color? ";
24  cin >> user_fav_color;
25
26  // Questions regarding the Crush
27  cin.ignore();
28
29  cout << "Enter your crush's name: ";
30  getline(cin, crush_name);
31
32  cout << "Enter your crush's age: ";
33  cin >> crush_age;
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```

```

At line:1 char:1
+ Lab2
+ ~~~~~
+ CategoryInfo          : ObjectNotFound: (Lab2:String) [], CommandNotFoundException
+ FullyQualifiedErrorId : CommandNotFoundException

PS C:\Users\Zavier26\Downloads\CSC1300\CSC1300\Labs> cd Lab2
PS C:\Users\Zavier26\Downloads\CSC1300\CSC1300\Labs\Lab2> g++ .\lab2b.cpp
PS C:\Users\Zavier26\Downloads\CSC1300\CSC1300\Labs\Lab2> .\a.exe
**** WELCOME TO THE CRUSH COMPATIBILITY TESTER***
Enter your name: S

```

## STEP 4: ADDRESS LOGIC ERRORS

If the program runs but the output is incorrect or unexpected:

1. **Identify the problem:**
  - a. Compare the program's actual output to the expected output.
  - b. Describe what the program is doing versus what it should be doing.
2. **Observed Behavior:** I noticed that the code was giving me a number but it was had 4 decimals behind it.
3. **Expected Behavior:** It was supposed to use the two main integer then follow by 2 decimal places Ex. 92.23
4. **Test individual sections:**
  - a. Use print/cout statements or a debugger to isolate which part of the code is not working as intended.
5. **Locate and fix the error:**
  - a. Analyze the problematic section.
  - b. Document the issue and your solution:

6. **Logic Error:** The number would print outside of its decided bound
7. **Solution:** I used fixed Precision(2) to make sure it would only go up to 2 decimal point
8. **Re-run the program:**
  - a. Test whether your fix resolved the issue.
  - b. If not, repeat this step. **Do not** delete your previous responses or screenshot, just add to them with the new bug and new solution.

### Screenshot 7:

The screenshot shows the Visual Studio Code interface with the following components:

- EXPLORER:** Shows the project structure with folders for 'CSC1300', 'Labs', and 'Programs'. The 'Labs' folder is expanded, showing 'Lab1' through 'Lab11'. 'Lab2' is selected, containing 'a.exe' and 'lab2b.cpp'.
- EDITOR:** Displays the code for 'lab2b.cpp'. The code prompts the user for their name, age, and favorite color, then calculates a compatibility score using a formula involving static\_cast and setprecision(2). The code is as follows:
 

```

11 int main()
12 {
13     string user_name;
14     cout << "Enter your crush's name: ";
15     getline(cin, crush_name);
16
17     cout << "Enter your crush's age:";
18     cin >> crush_age;
19
20     cout << "What is the first letter of your crush's favorite color? ";
21     cin >> crush_fav_color;
22
23     // Math behind compatibility
24     result= ((static_cast<double>(user_age) / static_cast<double>(crush_age)) * 100 - (user_fav_color + crush_fav_color) % 10);
25     // Result
26     cout << user_name << " and " << crush_name << " are " << fixed << setprecision(2) << result << " compatibility.";
27     cout << endl;
28
29     return 0;
30 }
      
```
- TERMINAL:** Shows the command prompt output for running the program:
 

```

PS C:\Users\Zavier26\Downloads\CSC1300\CSC1300\Labs\Lab2> ./a
**** WELCOME TO THE CRUSH COMPATIBILITY TESTER****

Enter your name: Zavier
Enter your age: 19
What is the first letter of your favorite color? B
Enter your crush's name: Ariel
Enter your crush's age:19
What is the first letter of your crush's favorite color? W
Zavier and Ariel are 103.00 compatibility.
PS C:\Users\Zavier26\Downloads\CSC1300\CSC1300\Labs\Lab2>
      
```

## STEP 5: ITERATE UNTIL CORRECT

1. **Continue debugging:**
  - a. Repeat each debugging process until the program runs correctly and produces the desired output.
2. **Document additional issues and fixes:**
  - a. Use the template from Steps 3 and 4 to track any new errors introduced during debugging.
3. **Final Output:**
  - a. Paste a screenshot of the final, correct output below:

The image shows a Visual Studio Code editor window with a C++ program open. The program is titled "lab2b.cpp" and is located in the "CSC1300" folder. The code is as follows:

```
1 int main()
2 {
3     // Variables
4     int user_age, crush_age;
5     string user_name, crush_name;
6     int user_fav_color, crush_fav_color;
7
8     cout << "Enter your crush's name: ";
9     getline(cin, crush_name);
10
11     cout << "Enter your crush's age: ";
12     cin >> crush_age;
13
14     cout << "What is the first letter of your crush's favorite color? ";
15     cin >> crush_fav_color;
16
17     // Math behind compatibility
18     result = ((static_cast<double>(user_age) / static_cast<double>(crush_age)) * 90 - (user_fav_color + crush_fav_color) % 10);
19     // Result
20     cout << user_name << " and " << crush_name << " are " << fixed << setprecision(2) << result << " compatibility.";
21     cout << endl;
22
23     return 0;
24 }
```

The program is executed, and the output is shown in the Terminal:

```
Zavier and Ariel are 103.00 compatibility.
PS C:\Users\Zavier26\Downloads\CSC1300\CSC1300\Labs\Lab2> .\a.exe
**** WELCOME TO THE CRUSH COMPATIBILITY TESTER****

Enter your name: Zavier Fowler
Enter your age: 18
What is the first letter of your favorite color? B
Enter your crush's name: Ariel
Enter your crush's age: 19
What is the first letter of your crush's favorite color? w
Zavier Fowler and Ariel are 99.74 compatibility.
PS C:\Users\Zavier26\Downloads\CSC1300\CSC1300\Labs\Lab2>
```

**Note:** Don't forget to go back to your **Spring 2025 Lab 2 Assignment** document to complete the final **Part 3** of the assignment and to see submission instructions.