

CSCI 200 - Fall 2023

Foundational Programming Concepts & Design

Lab 2B - Pointers: Addresses & Values



This lab is due by Tuesday, September 26, 2023, 11:59 PM.

As with all labs you may, and are encouraged, to pair program a solution to this lab. If you choose to pair program a solution, be sure that you individually understand how to generate the correct solution.

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The goal of this lab is to gain familiarity with using the concepts of pointers and addresses. Complete the following steps inside your `main()`. This lab will only be working with pointers on the stack.

1. Declare two integers named `iNum` and `iNum2` with initial values `4` and `5` respectively.
 2. Declare two pointers to integers named `pINum1` and `pINum2` both with initial value `nullptr`.
 3. Assign the address of `iNum` to `pINum1`.
 4. Assign the address of `iNum2` to `pINum2`.
 5. Output the address of `iNum` and be sure to identify to the user what you are displaying. There are two ways you can do this; you should do both, to convince yourself they are the same.
 6. Output the address of `iNum2` and be sure to identify to the user what you are displaying. There are two ways you can do this; you should do both, to convince yourself they are the same.
 7. Use `pINum1` to display the value of `iNum`.
 8. Use `pINum2` to display the value of `iNum2`.
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9. Directly change the value of `iNum` to `6`.

10. Use `iNum` to output the value of `iNum`.
 11. Use `pINum1` to output the value of `iNum`.
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12. Use `pINum1` to change the value it is pointing at to `7`.
 13. Use `iNum` to output the value of `iNum`.
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14. Assign `pINum2` to have the same value as `pINum1`. Do not reference `iNum`; instead use the address stored in `pINum1`.
 15. Output the value of `pINum2`. This should be the same as displayed in step 5.
 16. Output the value pointed to by `pINum2`.
 17. Using `pINum2`, change the value it is pointing at to `8`.
 18. Output the value of `iNum` three times, first using `pINum1`, then using `pINum2`, then `iNum` directly. In each case, identify what the user is seeing appropriately.
 19. Output the value of `iNum2`. It should remain unchanged from the initial value.
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20. Declare a pointer to a double named `pDNum` with initial value `nullptr`.
 21. Try to assign the address of `iNum` to `pDNum`. Compile your program. What error message do you see? Comment out this bad line of code, but include the error message as a comment with this line.
 22. Try to assign the value of `pINum1` to `pDNum`. Compile your program. What error message do you see? Comment out this bad line of code, but include the error message as a comment with this line.
 23. Declare a double named `dNum` with initial value `14.25`.
 24. Assign the address of `dNum` to `pDNum`.
 25. Output the address and then the value of `dNum` using `pDNum` for both.
 26. Try to assign the value `pINum1` is pointing at to the value `pDNum` is pointing at.
 27. Output the value of `dNum` two times, first using `dNum` then using `pDNum`.

Grading Rubric

Your submission will be graded according to the following rubric:

Points	Requirement Description
0.70	Fully meets specifications
0.15	Submitted correctly by Tuesday, September 26, 2023, 11:59 PM
0.15	Best Practices and Style Guide followed
1.00	Total Points

Lab Submission

Always, **always**, **ALWAYS** update the header comments at the top of your `main.cpp` file. And if you ever get stuck, remember that there is LOTS of **help** available.

Zip together your `main.cpp`, `Makefile` files and name the zip file `L2B.zip`. Upload this zip file to Canvas under L2B.

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Any questions, comments, corrections, or request for use please contact `jpaone {at} mines {dot} edu`.

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