

CS 2150 Exam 1, fall 2016

Name _____

You **MUST** write your e-mail ID on **EACH** page and bubble in your userid at the bottom of this first page. And put your name on the top of this page, too.

If you are still writing when “pens down” is called, your exam will be ripped up and not graded – even if you are still writing to fill in the bubble form. So please do that first. Sorry to have to be strict on this!

Other than bubbling in your userid at the bottom of this page, please do not write in the footer section of this page.

There are 6 pages to this exam. Once the exam starts, please make sure you have all the pages. Questions are worth different amounts of points.

If you do not bubble in this first page properly, you will not receive credit for the exam!

Answers for the short-answer questions should not exceed about 20 words; if your answer is too long (say, more than 30 words), you will get a zero for that question!

This exam is **CLOSED** text book, closed-notes, closed-calculator, closed-cell phone, closed-computer, closed-neighbor, etc. Questions are worth different amounts, so be sure to look over all the questions and plan your time accordingly. Please sign the honor pledge below.

*Three things are certain:
Death, taxes, and lost data.
Guess which has occurred.*

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Page 2: C++

1. [3 points] Is it okay to `#include` the same header file in different `.cpp` files? Why or why not?

2. [3 points] If passing by `const` reference is “safer” than passing by reference and has the same speed, why would you ever pass by normal reference?

3. [3 points] When making a linked-list empty, one might use the following code within a loop:

```
delete myIterator->current; and myIterator->moveForward();
```

. One would think this code would cause an error (accessing a node that was JUST deleted to follow its next pointer). However, the code works just fine. Why?

4. [3 points] List three pointer-related reasons for causing a segmentation fault.

Page 4: Numbers

9. [3 points] You are given the number 325 in base z . Give a general equation for the conversion of this number to decimal, and write what the minimum possible value of z (i.e., what is the minimum possible base for 325).
10. [6 points] Convert $4.3984375 = 4\frac{51}{128}$ to *little-Endian* IEEE 754 hexadecimal notation.
11. [3 points] What is the largest `double` value that can be represented? Explain your reasoning! You are welcome to leave your answer as an expression (i.e., equation).

Page 5: Miscellaneous

12. [3 points] Fill in the following UNIX commands:

- Show the contents in the current directory:
- Create a folder entitled “MyFolder”:
- Remove a folder entitled “MyFolder”:
- Remove a file entitled “MyFile.cpp”:
- Show the current directory you are in (i.e. show the path):
- Rename a file from “foo” to “bar”:

13. [3 points] Why do we like big-Theta instead of big-Oh?

14. [3 points] In C++, why do command line parameters get passed to main as two separate variables, `argc` and `argv`? Isn't this a little bit superfluous? Explain why these are split into two variables.

15. [3 points] Suppose you have functions f , g , and h and that $f \in O(g)$ and $h \in \Omega(g)$. Which of the following are true (you can just circle the true ones):

- $f \in O(h)$
- $f \in \Theta(h)$
- $f \in \Omega(g)$
- $g \in \Omega(f)$
- $g \in O(h)$
- $g \in \Theta(h)$

Page 6: No questions here

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