

Homework 1: Intro to C++

CS16 - Summer 2021

Due:	Thursday, July 1, 2021 (11:59 PM PDT)
Points:	100
Name:	-----
Homework buddy:	-----

- You may collaborate on this homework with **at most** one person, an optional “homework buddy.”
- **Submission instructions:** All questions are to be written (either by hand or typed) *in the provided spaces* and turned in as a single PDF on Gradescope. In other words, you must edit this file directly! Reach out on Slack if you want some suggestions on how to do this. Do not copy and paste the text into a word processor; we will not accept this and your homework may not be graded. If you submit handwritten solutions, write legibly. We reserve the right to give 0 points to answers we cannot read.

1. (5 points) Not including any comments that may appear, what are the first two lines that typically begin a C++ program that is either going to output on the screen and/or read input from the keyboard?

2. (5 points) What statement is the recommended way to end a C++ program?

3. (15 points) The textbook describes the difference between **syntax errors** and **logic errors**, as well as the difference between compiler output that produces **error messages** vs **warning messages**. Briefly explain each of the items below in a way that makes the *differences* among them clear.
- a. (5 points) Syntax error that results in an *error* message:
 - b. (5 points) Syntax error that results in a *warning* message:
 - c. (5 points) Logic errors:
4. (5 points) Assuming the variable **age** has already been declared as **int age**; what single statement of code will read in a value for **age** from the user?
5. (10 points) Assuming the variable **balance** has already been declared as **int balance**; write two code statements that will ask (prompt) the user for a value for **balance**, and then read in the value of **balance**.
6. (5 points) The textbook describes **C++11** on page 27. Briefly, what is C++11? (A one sentence answer is good enough.)

7. (10 points) The book talks about the 5 important components of a computer: (1) processor, (2) input devices, (3) output devices, (4) main memory, (5) secondary memory. It also talks about two important pieces of software: compilers and operating systems. What of the above is primarily responsible for each of the following tasks? Write “none” if none of the options apply.
- a. (2 points) Executes a program stored in main memory.
 - b. (2 points) Allocates the computer’s resources to different tasks.
 - c. (2 points) Stores a program while it is being executed.
 - d. (2 points) Stores a program when it is not being executed.
 - e. (2 points) Converts a program written in a high-level language to another high-level language.
8. (5 points) In one sentence, what is the role of a *compiler*?
9. (5 points) What is *object code* (and how is it different from C++ code)?

10. (10 points) If the following statement were in a C++ program, what would it do?

```
cout >> "A penny saved";
```

11. (10 points) If the following statement were in a C++ program, what would it do?

```
cout << "Is a penny earned.";
```

12. (15 points) Complete the following C++ program (as indicated by the comments) designed to calculate the area and circumference of a circle. The program gets the **diameter** parameter from the user and then prints out statements that say:

```
The area of this circle is: <RESULT HERE>
The circumference of this circle is: <RESULT HERE>
```

Notes: (1) In the output replace <RESULT HERE> with the appropriate results. (2) Use the C++ `const` keyword to declare a value for pi (π). (3) Your code must be syntactically correct (i.e. it should compile without error).

```
#include <iostream>
using namespace std;

int main() {
    // declare the variables here

    // calculate the results here

    // print statements here

    // end program

}
```