

# Homework 1: Intro to C++

CS16 - Winter 2021

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<b>Due:</b>	Tuesday, January 14, 2021 (11:59 PM PST)
<b>Points:</b>	100
<b>Name:</b>	-----
<b>Homework buddy:</b>	-----

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- 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. 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 author 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 this 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 ( $\pi$ ). (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
}
```