CS 115 Exam 1 Review Quiz, Spring 2010

Rules

- You may use one handwritten 8.5 x 11” cheat sheet (front and back). This is the only resource you may consult during this exam.

- You must show your work/explain your answers in order to receive partial credit for incorrect answers.

- All snippets of code can be assumed to be enclosed within `int main()`. You can assume that the `iostream, fstream, iomanip, string, algorithm, and cmath` libraries have been included at the beginning of the program.

- When you are asked to write a snippet of code, you may also assume that it is enclosed within `int main()` and that any necessary libraries have been included.

- When you are asked to write a complete program, you must write the `#include statements, the int main(), etc. in your solution to receive full credit.

- A line consisting solely of “…” represents one or more unspecified C++ statements, some of which may change the values of program variables.
Problem 1: 24 points.
What does each of the following snippets of code print to the screen?

(a)  
```cpp
string a = "b";
string b = "a";
cout << a << endl;
```

(b)  
```cpp
string a = "b";
string b = "a";
cout << a << b << endl;
```

(c)  
```cpp
int a = 5;
cout << ++a << endl;
```
(d)  
    for (int i=0; i < 2; i++) {  
        for (int j = 0; j < 2; j++) {  
            cout << j << endl;  
        }  
    }  

(e)  
    bool b = true;  
    if (b) {  
        b = b && false;  
    }  
    cout << b;  

(f)  
    int i = 4;  
    while (i > 0) {  
        cout << i << endl;  
        i -= 2;  
    }
Problem 2: 16 points.
State whether each segment of code is valid C++, meaning that it will compile. If it is valid, write “valid.” If it is invalid, write “invalid” and fix it so that it will compile.

(a)
```cpp
int a;
cin >> a;
if (sqrt(a)) {
    cout << "Moo!" << endl;
}
```

(b)
```cpp
int i = 5;
while (i--) {
    cout << i << endl;
}
```

(c)
```cpp
int q = 2;
if (q > 0); { 
    cout << "Baa!"
}
else { 
    cout << "Grrr!"
}
```

(d)
```cpp
int i = 25;
int j = 100;
i *= j;
```
Problem 3: 30 points.

Write short snippets of code to accomplish the following tasks:

(a) Assume:
   - An integer variable $N$ has already been declared and defined.

Your task:
   - Print the word “Hello!” $N$ times (if $N$ is negative, do not print the word at all).
   - Each “Hello!” should be on a separate line.

(b) Repeatedly ask the user to enter an integer. You should stop asking when
   - either
     - The user enters something that could not be read, or
     - The user enters a negative number

Other than prompting the user for an integer, your program should not print anything to the screen.
(c) Assume: Float variables $a$, $b$, and $c$ have been declared and defined. Your task:
   - Print “Yes!” if $a$, $b$, and $c$ could be the side lengths of a triangle. For this to be the case, each number must be less than the sum of the other two numbers.
   - Print “No!” otherwise.

(d) Assume: Float variables $a$ and $b$ have already been declared and defined. Your task: Print $a$, $b$, and $a^b$ (that is, $a$ raised to the power of $b$) as shown in the example below for $a=2$ and $b=3.5$:

   \[
   2 \text{ to the } 3.5\text{th power} = 11.3137
   \]

You do not need to worry about formatting the answer to a specific number of decimal places.
Problem 4: 30 points.
For this problem, you must write a complete program that does the following:

- Prompts the user to enter 100 integers. It should prompt for each integer individually.

- If the user enters an invalid input, the program should stop asking for integers and should not print anything else.

- Otherwise, after the user has entered all 100 integers, the program should print the maximum of the 100 integers.