CS 115 Exam 1, Fall 2009

Your name: __________________________________________________________

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.

Grade (instructor use only)

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

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

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

(d)
```
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.