CS 115 Exam 1, Spring 2011

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.

• Explain/show work if you want to receive partial credit for wrong answers.

Grade (instructor use only)

<table>
<thead>
<tr>
<th></th>
<th>Your Score</th>
<th>Max Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem 1</td>
<td></td>
<td>35</td>
</tr>
<tr>
<td>Problem 2</td>
<td></td>
<td>35</td>
</tr>
<tr>
<td>Problem 3</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
Problem 1: 35 points.
What will print to the screen when each of the following snippets of code is executed?

Assume that each snippet of code is inside main() and that all necessary libraries have been included.

(a)
```cpp
int a = 10;
cout << a << endl;
```

(b)
```cpp
string s1 = "lol";
string s2 = "omg";
cout << s1;
cout << s2;
```

(c)
```cpp
int a = 10;
int b = 4;
cout << a / b << endl;
```

(d)
```cpp
int a = 7;
if (a != 7 or a != 8) {
    cout << a << endl;
}
```
(e)
    int a = 2;
    if (a < 0) {
        a = a + 5;
    }
    else {
        a = a - 5;
    }
    cout << a << endl;

(f)
    int a = 2;
    int b = 3;
    while (a == b) {
        cout << b << endl;
    }
    cout << a << endl;

(g)
    bool x = (2 < 3);
    bool y = (3 != 4);
    cout << (x and y) << endl;
Problem 2: 35 points.

Write snippets of code to do the following.

You can assume that all your snippets are enclosed within `main()`. You can also assume that the `iostream` and `cmath` libraries have been included at the beginning of the program.

In your snippets of code, *DO NOT* use return statements to end the program!

(a) Prompt the user to type a word, and repeat that word back to them.

(b) *Assume:*

   o Two floating-point variables `r` and `h` have been declared and defined for you.

   *Your task:*

   Print the surface area of a cylinder whose radius is `r` and whose height is `h`. The formula for the surface area of a cylinder is:

   $$ 2\pi r^2 + 2\pi rh $$

   You can use 3.14 for pi.
(c) *Assume:*
- An integer variable \( a \) has already been declared and defined for you.

*Your task:*
Print the absolute value of \( a \) without modifying the value of the variable \( a \).

(d) *Assume:*
- A string \( s \) has already been declared and defined for you. The string will not be empty (will contain at least one character).

*Your task:*
Ask the user to guess your word. If they type in a string identical to \( s \), congratulate them. Otherwise, make them guess again until they get it right.

Remember not to use a return statement in this snippet of code.
(e) **Assume:**

- Two floating-point variables $a$ and $b$ have been declared and defined for you.

**Your task:** If these two variables (in any order) could be the side length and area of a square, print

The side length is ____.
The area is ____.

with the values of your two variables filled in the blanks. Otherwise, print nothing.

Remember that the side length and area of a square should be *positive* (greater than 0).
Problem 3: 30 points.
For this problem, you must write a complete program. To write a complete program, you must write the #include statements, the int main(), etc. in your solution to receive full credit. You may use return statements in this program.

Read the instructions carefully before you start coding!

Your program should do the following:
1. Prompt the user to enter the price of an item.
2. If the user enters a non-negative number, keep asking the user to enter more prices.
3. If the user enters something that cannot be read as a floating-point number, the program should print an error message and exit immediately.
4. If the user enters a negative number or 0, print the amount the user owes:
   
   You owe ____.

The amount the user owes is the total of all the (non-negative) prices the user has entered with an additional sales tax of 9.25%.