Exam 1

CSI 201: Computer Science 1
Fall 2018
Professors: Shaun Ramsey

I understand that this exam is closed books and closed notes and is to be completed without a calculator, phone, or other computer. It is clear that I am cheating or plagiarizing if these items are seen in use by me during the exam. I am **NOT** allowed to use any external resources to complete this exam. All of the work that I am submitting for this exam is mine. I understand that it is also my job to protect my own answers from others. I understand that I can cheat or plagiarize on an exam by my own collaboration but also through my own negligence (in keeping my answers secret). I have completed this exam in accordance with the Washington College Honor Code. I understand that images, video and sound may be taken and recorded during this exam. Remember to use good style and programming practice throughout. Read directions thoroughly.

Name: _____

Signature: _____

Section: _____

1. 20 points Write the output for each code snippet. Each snippet is worth 2 points.

Code Snippet:	Console Output:
```int hours = 36;\ncout << "full " << hours/24 << endl;\ncout << "left " << hours%24 << endl;```	full 1 left 12
```for(int i = 0; i < 3; i++) {\n cout << i * 3 << endl;\n}```	0 3 6
```int number = 11;\nif(number < 7 || number > 13) {\n cout << "lucky" << endl;\n}\nelse {\n cout << " not so " << endl;\n}```	not so
```int exponents = 1;\nwhile(exponents < 20) {\n cout << exponents << endl;\n exponents = exponents * 3;\n}```	1 3 9
```double eps = 0.01;\ndouble num = 0.0;\nif(num < eps && num > -eps) {\n cout << "close" << endl;\n}\nelse {\n cout << "eps" << endl;\n}```	close

2. Concepts: answer with 1-2 lines of code or briefly as appropriate.

(a) 4 points Demonstrate how to declare a variable that represents the name of our school. Initialize it with an appropriate value.

string school_name = "washington College";

(b) 4 points For what values of x does the following code output "1782".

```
if(x > 1782 && x < 2022) {
    cout << "1782" << endl;
}
```

When x is between 1782 + 2022 exclusive.

(c) 4 points Write a loop that runs 1782 times.

for(int i=0; i<1782; ++i) {

}

(d) 4 points What should the user type into the console to stop the following loop:

```
while(var == "WC") {
    cout << "QUACK" << endl;
    cin >> var;
}
```

any string except "wc"

(e) 4 points Why do we compile our C++ code?

To turn it into machine executable code. (a side effect is that it finds syntax errors but that's actually a failed compile)

3. **16 points** Find four kinds of errors in the following code snippet. Identify each error that you found in the space below. Explicitly explain the error (describe what is missing or incorrect), don't simply write the code where the error exists (unless you're fixing it to point out the error instead of describing the error). There may be more than four errors, but you only need to find four. Do not include duplicate errors. Refer to lines using the given line numbers.

```
/* Code Snippet begins here */

1. int distance = 0; //displacement
2. int velocity = 0, accel = 0;
3. cin >> velocity >> accel >> t;
4. while(velocity < 0 || accel < 0 || t < 0) {
5.    cout << "ERROR << endl;
6.    cin >> velocity >> accel >> t
7. }
8. distance == velocity * t + 0.5 * accel * t * t;
9. cout << "Total distance traveled is " distance << endl;

/* Code Snippet ends here */
```

Error 1. _____ " quotation missing after ERROR _____ Line #: 5

Error 2. _____ ; semi-colon missing after t _____ Line #: 6

Error 3. _____ extra =, assignment uses only one = _____ Line #: 8

Error 4. _____ << stream operator missing between " distance _____ Line #: 9

4. [20 points] (a) Your room can only hold 100 sq. ft. of furniture. In this code, you'll read in the size of three pieces of furniture and then determine if it will fit within this size. Here are your steps. Write code to read in the size of three pieces of furniture as sq. ft. These numbers may have decimals. When the total sum of these three pieces is within 100 sq. ft. then output to the console that these pieces might fit in the room. Otherwise, output that they will definitely not it. sq. ft. stands for square feet and is a unit of measurement denoting an area. If it helps, you can replace sq. ft. with ft^2 or m^2 as you think about this problem. Also, just because the furniture is less than 100 sq. ft. doesn't mean it will actually fit in the room. If the room is 10 ft. x 10 ft. and the three pieces of furniture have a base of 15 ft. x 1 ft. (only 15 sq. ft. each), then none of the pieces would really fit on the floor of this room.

```cpp
#include <iostream>
using namespace std;
int main() { // Your code goes here
    double furniture1 = 0, furniture2 = 0, furniture3 = 0;
    cin >> furniture1 >> furniture2 >> furniture3;
    if( furniture1 + furniture2 + furniture3 <= 100) {
        cout << "These may fit!" << endl;
    }
    else {
        cout << "These definitely will not fit." << endl;
    }

// end of your code
return 0;
}
```

(b) In this problem, your job is to create math problems for elementary school students to practice their mathematics. Here are your steps. Read in a string from the user. Valid values are "plus" and "done". Then get three integers from the user. The first two integers (along with the string) form the question. The last integer is the answer. If the word was plus and the third integer is the sum of the first two integers, then output "CORRECT!" When the word is plus and the third is not the sum of the first two, output "Try again!". Allow the user to re-enter the third integer until the sum is correct. Lastly, get a new string from the user. As long as they continue to type something other than "done" then, repeat this entire process starting at "get three integers from the user". Here is an example. An example input string is: "plus 3 66 7 5 6 pow pow plus 1 1 2 done" This produces the output string: "Try again! Try again! Try Again! CORRECT! CORRECT!"

```cpp
#include <iostream>
#include <string>
using namespace std;
int main() { // Your code goes here
    string what = "unknown";
    int first = 0, second = 0, answer = 0;
    cin >> what;
    while (what != "done") {
        if (what == "plus") {
            cin >> first >> second >> answer;
            while (first + second != answer) {
                cout << "Try Again!" << endl;
                cin >> answer;
            }
            cout << "CORRECT!" << endl;
        }
        cin >> what;
    }
// end of your code
return 0;
}
```

Question	Points	Score
1	20	
2	20	
3	16	
4	20	
Total:	76	