Exam 1

CSI 201: Computer Science 1
Fall 2016
Professors: Shaun Ramsey and Kyle Wilson

Question	Points	Score
1	20	
2	21	
3	20	
4	20	
Total:	81	

I understand that this exam is closed book and closed note and is to be completed without a calculator, phone, or other computer. 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 have completed this exam in accordance with the Washington College Honor Code.

Name: _Key!_

Signature: _____

Section: _____

This color corresponds to the answer.
This color corresponds to explanation.

1. 20 points Write the output that each code snippet would produce:

Code Snippet:	Console Output:
| ```
int a = 13;
int b = 6;
cout <<  a / b + 1 << endl;
``` *INTEGER ARITHMETIC* 13/6 is 2R1 2+1=3 | 3  4pts |
| ```
if (true || false) {
    cout << 5 << endl;
}
else if (true || true){
    cout << -3 << endl;
}
``` NEVER RUNS BECAUSE THE WAS TRUE | 5  4pts |
| ```
int i = 0;
while (i < 6) {
    cout << i * 2 << endl;
    ++i;
}
``` Increases i by 1   DOES NOT CHANGE i! | 0 2 4 6 8 10  4pts |
| ```
int j = 17;
int n = 5;
while (j > 0) {
    j = j / 2;
    cout << "j=" << j << endl;
    j = j - 1;
}
``` RECALL INTEGER ARITHMETIC AGAIN 17/2=8, 7/2=3, 2/2=1  8→7, 3→2, 1→0 | j=8 j=3 j=1  4pts |
| ```
int b = 4;
if (b % 2 == 0 && b > 4) {
    cout << b / 2 << endl;
}
if (b % 2 ==  1) {
    cout << b + 1 << endl;
} else {
    cout << b + 4 << endl;
}
``` true false  false | 8  4pts |

2. Concepts: answer each question briefly.

   (a) ⟨3 points⟩ What include command is required to use the `time` function? (Write the one line of code as you would if you were writing a program.)

`#include <ctime>`

   (b) ⟨3 points⟩ Write one line of code that declares a variable called `best_400m_freestyle_time`, without initializing the variable. Use the most appropriate variable type.

`double best_400m_freestyle_time;`

I choose this in case the time needs fractional parts of the "time" unit

   (c) ⟨3 points⟩ What does the function `srand` do?

Seeds the random number generator (tells it where to start)

   (d) ⟨3 points⟩ Give four C++ arithmetic operators.

`+`   `*`   *makes sense to also know the operators for relational + boolean operators also*
`-`   `/`

   (e) ⟨3 points⟩ Is this expression true, or false:

`!((true && false) && (true || false))`

false & true

true → false

true

   (f) ⟨6 points⟩ `x` is an `int`. Write a few lines of code to do this: increase `x` by 2 if `x` is one of these numbers: [1, 3, 5, 7, 9, 11, 13, 15, 17, 19]

```
if(x >= 1 && x <= 19 && x%2 == 1) {
    x = x + 2;
}
```

Also accepted just `if(x%2 == 1)`, but only because we didn't want there to be any confusion of whether we meant all odds or not!

3. 20 points Find four kinds of errors in the following code snippet. Identify each error that you found in the space below. There may be more than four errors, but you only need to find four. Do not include duplicate errors; that is, if two lines are missing semicolons, only include one of them. Refer to lines using the given line numbers.

```
1.   // Prompt the user for a number
2.   int n;
3.   cout >> "Enter your number: "
4.   cin >> n >> endl;
5.
6.   // Say if the number is even or odd
7.   if (n % 2 == 0) {
8.       cout << n " is odd" << endl;
9.   }
10.  else {
11.      cout << n " is odd" << endl;
12.  }
```

[Handwritten annotations:]

5 pts each

Error 1. *Missing end semi-colon ;*   Line #: **3**

compiler errors

Error 2. *endl does not belong attached to cin*   Line #: **4**
(When compiling, this error produces pages of compiler output.

Error 3. *missing << between n and "*   Line #: **11** *← repeats on line 8*
This error

logical error

Error 4. *n is actually even in this line*   Line #: **8** *← you must specify line 8 here*
Line 11 is odd

you could say line 7 & line 11 are wrong by changing n%2 == 1 & then 11 should say even

means double ↑

probably need → *and OR or*

4. 20 points Write a program to asks the user for a (decimal) number between 1 and 10 (inclusive—the numbers 1.0 and 10.0 are good input). Keep asking until the user does this correctly.

Implies a loop

To save time, the includes and a main are given to you. Be clear about using proper indentation!

```cpp
#include <iostream>
using namespace std;

int main() {

    // Your code goes here
    double number = 0.0;
    while (number < 1 || number > 10) {
        cout << "Input number between 1 and 10 :";
        cin >> number;
    }
```

Possible rubric:
1) Declares variable of appropriate type
2) Uses a loop
3) Has an appropriate conditional
4) Has a cin statement
5) Overall style, form and structure
} 4 pts each

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