

CS 31 Worksheet Week 2

This worksheet is entirely **optional**, and meant to prepare you for upcoming projects and exams. Some problems will be more challenging than others and are designed to have you apply your knowledge beyond the examples presented in lecture, discussion or projects. We encourage you to collaborate with your peers while completing this worksheet. If you finish the worksheet early, you are welcome to inquire with your LA for this week's Supplemental Problems.

Note: All exams will be completed on paper, we highly encourage you to complete these problems on paper

Topics Covered: If Statements, Cin, Variables, Doubles, Ints

Reading Problems

1. Assume that the following lines of code are inside the main function, with `#include <iostream>` and using namespace `std`, and all the string variables used have been previously declared.

- (a) Highlight where the bug occurs.
- (b) Explain what you think will happen when running the program.
- (c) Is this a logic error or a compilation error? Why?
- (d) Add a fix to the problem you found in part (a).

```
string name;
cout << "Enter your name: ";
getline(cin, name);

int UID;
string major;

cout << "\nEnter your UID: ";
cin >> UID ;

cout << "\nEnter your Major: ";
getline(cin, major);

cout << "\nEnter your residence hall: ";
getline(cin, hall);
```

```
cout << "\n" << UID << " is the ID of " << name
    << ", a " << major << " student who lives in " << hall << endl;
```

Time: 10 min

2. What is the output of the following code?

```
int cookies = 12;
int mms = 120;
if (mms % cookies != 0) {
    cout << "Can't evenly split M&Ms for each cookie!" << endl;
} else {
    cout << "We have " << mms/cookies << " M&Ms per cookie." << endl;
}
```

Time: 3 min

3. This code snippet takes a certain “hour” and “weekday” and tries to tell you if you can buy turnips from Daisy Mae, the turnip seller.

- (a) Find the 7 lines with mistakes in the code and fix them.
- (b) Will this code compile? Why or why not?
- (c) After you fix the bugs, imagine you input 10 for the hour, then “Sunday” for the weekday. What will this program say to you?

```
int hour;
string weekday;
cin << hour;
cin << weekday;

if (weekday != "Sunday" || hour >= 12)
    cout >> "Daisy Mae is not here!" >> endl
else {
    if (hour = 11) {
        cout >> "It's almost 12! Hurry up!" >> endl;
    } else {
        cout >> "Buy turnips with Bells." >> endl;
    }
}
```

Time: 10 min

4.

- (a) Highlight where the bug occurs.
- (b) Explain what you think will happen when running the program and why.
- (c) After deleting the bugged line of code, what will the remaining program output? Can you explain every line of output?

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

int main() {
    int elligent = 64;
    int eresting = 0;
    double rainbow = 64.0;
    double stuf = 0.0;

    cout << elligent << endl;
    cout << rainbow << endl;

    eresting = elligent/2.5;
    stuf = rainbow/3;
    cout << rainbow/3 << endl;
    cout << stuf << endl;
    cout << elligent/2.5 << endl;
    cout << elligent/(rainbow-64) << endl;
    cout << eresting << endl;
}
```

Time: 7 min

Programming Problems

1. Write a program that asks for a number between 0 and 100 (exclusive), and takes an integer input. If you input a number greater than or equal to 100, it will print "Liar, liar, plants for hire". If you input a number less than or equal to 0, it will print "Liar, liar, plants for hire"

After this, if your number is at least 50, and will print "Almost to 100!" (in addition to the above possibilities) Otherwise, it will print "Still a-ways to go!"

Example Output:

Case one:

Please give me a number between 0 and 100

0

Liar, liar, plants for hire.

Case two:

Please give me a number between 0 and 100

95

Almost to 100!

Case three:

Please give me a number between 0 and 100

45

Still a-ways to go!

Case four:

Please give me a number between 0 and 100

105

Liar, liar, plants for hire.

Almost to 100!

Time: 10 min

2. Write a program that takes in two numbers and a command of type string ("Add", "Subtract", "Multiply", "Divide"). Inputting an invalid command should cause the program to print out "Invalid command!" and stop.

Sample output:

Enter your first number: 3

Enter your second number: 7

Enter your command: Multiply

Result: 21

Time: 10 min

3. (This may be out of scope for this week, but you can try it as a challenge question!)
Write a program that takes in a number as an int and outputs the sum of all of the digits in that number.

Sample Output:

Enter a number: 184

The sum of the digits in your number is 13!

Time: 10 min (if you know how to use a loop)

Conceptual Problems

1) When using cin, the standard notation is

```
int n;  
cin >> n;
```

However, when using cout, the standard notation is

```
int n = 5;  
cout << n;
```

Why do you think the angle brackets are pointed right for *cin* but left for *cout*? How might this help you remember the correct direction?