**CS 161 Week 5 Worksheet:**

**More Functions, References and Pointers**

## Functions

1.  What are pre-conditions and post-conditions? Pre-conditions and post-conditions become (slightly!) more important when the function in question has reference parameters. For each of the three following functions, write down a brief description of their purpose, as well as their pre-conditions and post-conditions.

    ```
    double calc_average(double sum, int count){
         return sum/count;
    }
    ```

    ```
    void swap_chars(string &str) {
         char first = str.at(0);
         str.at(0) = str.at(1);
         str.at(1) = first;
    }
    ```

    ```
    void update_average(double &average, int &count, double new_val)
    {
         double sum = average*count;
         sum += new_val;
         count += 1;
         average = sum/count;
    }
    ```

2.  What is a default argument and where does it need to be?

3. Can you ever have multiple functions with the same name in C++? Explain

**References and Pointers**

1. What is your understanding of Pass by Value and Pass by Reference?

2. Compare and contrast C++ references and pointers.

3. With what you now know, how would you make the following code work?
```
void add_one(int a){
    a++;
}
int main() {
    int a = 5;
    add_one(a);
    cout << 5 << "plus 1 = " << a << endl;
    return 0;
}
```