Name: _____

CS 161 Week 5 Worksheet:

Functions and References

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 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.

Variable References and Scope

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

2. 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;
}
```

3. Fill in the blank line with a function call to swap the values of a and b.

```
void swapnum(int& i, int& j) {
  int temp = i;
  i = j;
  j = temp;
}

int main() {
  int a = 10, b = 20;
  cout << "A is " << a << " and B is " << b << endl;

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  cout << "A is " << a << " and B is " << b << endl;
  return 0;
}
```

4. What will this program print?

```
int main() {
  int s = 17;
  if (s < 3)
      int s = 10;
  else
      int s = 3;
  cout << s << endl;
  return 0;
}
```