Exercise #5  
Due Friday, 02/05/2016, at 11:59pm

Vocabulary  
Give a brief definition of each of the following terms:

- Variable Scope  
- Reference  
- Precondition  
- Postcondition

Using References  
While references can be a powerful tool in your programming skillset, it’s important to remember that taking advantage of them can come at a cost! Think about and explain why using references in function parameters can make it more difficult to reason about code, and what steps you can take to ensure your code is correct when using functions with reference parameters.

More Preconditions and Postconditions  
Preconditions and postconditions 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 preconditions and postconditions.

```java
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;
}
```

Assignment 4 Design  
The first section of assignment 4 requires you to design and implement an entire game of Wheel of Fortune that multiple people could play. This is a pretty big step up in terms of size and complexity from your last assignment, so you need to get started thinking about your assignment’s design and functional decomposition early on.

As the last part of this exercise, read through Assignment 4 and think about three or four important functions you may implement in your code. For each of those functions, answer the following questions:

- What is the purpose of the function? What task will the function perform?
- What other parts of the program will make use of the function?
- What should the parameters and return type for the function be?
- What are the function’s preconditions and postconditions?

Remember: This is just meant to get you started on the next assignment! You’ll have to do much more design work outside of this exercise to do well on the assignment.

For take-home exercises completed in peer-led groups, each student must participate in the class discussion and write answers to each of the questions on his/her own paper to show for credit.

For take-home exercises completed on your own, turn in your work electronically using the TEACH website.