

Quiz 3 Sample

1) Write a function that calculates and returns the n^{th} Triangle Number, where n is the input parameter. You may assume that n is guaranteed to be positive. Note that n^{th} Triangle Number is the sum of the first n positive integers. For example, the 5th Triangle Number is 15, since $1 + 2 + 3 + 4 + 5 = 15$. (Note: You will get **no** credit on this question if you put a `printf` in this function.) Please fill out the function definition provided below:

```
int triangle(int n) {
```

```
}
```

2) The file “numbers.txt” has exactly 10000 non-negative integers in it, one per line. Complete the program below so that it opens the file, reads in all the integers, determines how many of those integers end in each digit, prints this information out, and closes the file. (See the document camera projection for a sample for clarification.)

```
#include <stdio.h>
```

```
int main() {
```

```
    return 0;  
}
```


8) An inversion in an array, **arr**, is when a pair of values in the array such that $\text{arr}[i] > \text{arr}[j]$ but $i < j$. (Essentially it's a pair of values that are out of order.) For example, in the array $[6, 3, 8, 1]$, the inversions are $(6, 3)$, $(6, 1)$, $(3, 1)$ and $(8, 1)$. For each pair, the first number appears somewhere to the left of the second number (in a lower index), but is bigger than the second number. Complete the function below so that it takes in an integer array, **arr**, and its length, **length**, and returns the number of inversions in the array.

```
int numInversions(int arr[], int length) {
```

```
}
```