CS 1713
Introduction to Computer Programming II
Assignment 6
Due Wednesday April 19

1. (100 pts) Write a program to find the frequency of words in a file. You need to use dynamic memory allocation for this assignment. Use array of pointers to store the words and frequencies. Set array size to 1000 and initialize all the pointers to NULL. Structure declaration to store words and frequencies is as follows

```
struct wordfreq {
  int count;
  char *word;
};
```

When you see a word for the first time, insert into the array with count 1. If the word read from file is already in the array, increase its count. In this structure, you need to dynamically allocate the space for each word using *malloc*().

Use *argc* and *argv* for input file and output file. Sample execution of the program is given below. *words.txt* is the input file which contains one word per line. *frequencies.txt* is the file to be generated by your program. It contains frequencies and words, one word and its frequency per line.

```
elk05> assign6 words.txt frequencies.txt
```

Sample input file is given below

```
apple
orange
apple
banana
orange
orange
```

Output file for above input is given below

```
2 apple
3 orange
1 banana
```

Don't forget to deallocate all the space allocated using *malloc*() and *calloc*() using $free()$ function. Run your program under *valgrind* as shown below to verify that you have no memory leaks.

```
elk05> valgrind assign6 words.txt frequencies.txt
```

Somewhere in the output it should say *All heap blocks are freed.*

Submit your program electronically using the blackboard system

The program you submit should be your own work. Cheating will be reported to office of academic integrity. Both the copier and copiee will be held responsible.