**CS 2123 Data Structures**
**Recitation 4**
**Due Friday March 11**

Difficulty ⋆⋆⋆ (out of 5)

1. (100 pts) Write a program to find the word frequencies in a txt file. Use a binary tree to store the words and maintain a count for each word. Each node of the binary tree has a dynamically allocated string and the frequency. If the word is not in the tree, insert it with a frequency of 1. If the word is in the tree, increase its frequency. You need to use string processing functions to compare strings.

   The output of the program is words and their frequencies listed in increasing order of frequency.

   - Your frequency count should not be case sensitive. *Apple* and *apple* should be counted as same word. Convert all the words to lowercase before storing in the tree.
   - Skip punctuation characters and the following characters: space, tab character, newline character, carriage-return and form-feed character. All other characters should be considered part of the word.
   - Dynamically allocate the strings and the binary tree. Free all the allocated space before exit and use *valgrind* for potential memory errors.
   - Use *argc* and *argv* in your program.

   For the following file a.txt

   ```
   The red car hit the blue car.
   ```

   When you execute your program as

   ```
   fox01> recitation4 a.txt
   ```

   The output should be as follows

   ```
   1  blue
   1  hit
   1  red
   2  car
   2  the
   ```

   Test your program with different files.

*Submit your program electronically using the blackboard system. Only one member of the group should send it. List the name of the group members on the top of your submission.*