**ECE 1111: Engineering Computation I**

**Homework No. 10: Application Programming – Windowed Grep**

**Deposit your work in:**

**/data/courses/ece\_1111/current/homework/hw\_11/<lastname\_firstname>**

**Goal:** Locating text in a file is one of those extremely fundamental capabilities that Unix excels at with commands such as grep. In this assignment, you will write a simple version of grep that provides some flexibility for how the output is presented.

**Description:** Write a program that has the following user interface:

**mygrep.exe -w “word” -n num\_lines file1.txt file2.txt ...**

The program cycles through all the files specified on the command line and searches each line for a match to *“word”*. The match should be case-insensitive.

When you find a match, output the lines immediately before and after the match. For example, suppose you specify the options *“-n 2 -w bOB foo.txt”* and the file foo.txt contains:

**See Jane run.**

**See Mike run.**

**See Mary run.**

**See Bob run.**

**See Alice run.**

**See Tom run.**

**See Barbara run.**

The output should be:

**===**

**File: foo.txt**

**See Mike run.**

**See Mary run.**

**SEE BOB RUN.**

**See Alice run.**

**See Tom run.**

**===**

In other words, you should print the filename that produced the match, line that matched and the preceding two lines and following two lines because *“n = 2”*. Print the line that matched in upper case and make sure the match is case-insensitive (note the mixed case in my example).

Do not read the entire file into memory. You can use fgets to read the file, but you must use a streaming data approach (meaning buffering the data in a buffer of *2n+1* lines). Think about how you can use an array of character string pointers as a data structure to facilitate maintaining the most recent *2n+1* lines from the file in memory.

Time your code on a set of text files that have one million lines of text in them. Compare the execution time of your code to the Unix version of grep. Put your results in the top of your main program in the comment area.