**MCS 253P**

**HW 4**

* Use STL containers, iterators, algorithms, and (perhaps) lambdas, functions or function objects to write the two programs described below. **Do not use any low-level C++ loops** - this means **while () …** and **for (...;...;...)....** and even **for (auto E: L) …** Instead use ***copy()*** and ***for\_each()*. (**See examples in lecture notes for **“Stream Iterator with Files”**).
  + Suggestion: consider spending time up front to learn and practice these new features of C++ **before** you begin actually coding your assignment (particularly reading and writing files, lambda functions, and iterators and how they are used with ***copy()*** and ***for\_each()***). Look at the lecture notes, do some research on your own, practice with some toy examples.

1. Write a program called ***process\_numbers.cpp*** that reads a sequence of integers from the file [***rand\_numbers.txt***](https://drive.google.com/file/d/0B6y-rECIRItyem01SHVJYjYyeFk/view?usp=sharing). Your program should put the integers in a **vector**, sort them in ascending order, write the odd ones (*with each number separated by a space*) to a file named ***odd.txt,*** and write the even ones (*each number on a line by itself*) to a file called ***even.txt***. Note the numbers in the output files will each be in ascending order because you sorted the initial list of integers you put in a vector.
2. Write a program called ***mapset.cpp*** that counts the frequency of occurrence of each word in the file [***sample\_doc.txt***](https://drive.google.com/file/d/0B6y-rECIRItyY3lVSThLSzFYWG8/view?usp=sharing) while excluding certain common words. Ignore letter case differences by converting each word (both input and exclude words) into all lower case. Print the list of words with their respective frequencies to a file named ***frequency.txt***. Use set, map, and lambda in your solution. Details:
   1. Define a word exclusion **std::set** containing words from the file [***stopwords.txt***](https://docs.google.com/document/d/1rmmLOlPeQ1T6iYQHJlwMhlWAiCeOJ8N1uH6g3iZRksA/edit?usp=sharing)
   2. Store each word of [***sample\_doc.txt***](https://drive.google.com/file/d/0B6y-rECIRItyY3lVSThLSzFYWG8/view?usp=sharing) (that is not a stopword) in a **std::map**. Use the word as the *key* for your map and store the frequency of occurrences as its *value*. All punctuation has been removed from the input file, so your program need not handle punctuations.
   3. Write the words with their associated count (one word with its count per line, in ascending order by *key*) to the output file ***frequency.txt***.

* Note use ifstream and ofstream for creating I/O streams bound to name files and use stream iterators for reading and writing the named files.