Homework 6
Due: Friday 2/2 at class time.

Setup
Project name: hw6 – create this inside your homeworks repository.
Source file: hw6.cpp
Date files: download dataset1.txt and dataset2.txt from d2l and place inside the hw6 directory.

This assignment will output the dataset size, the minimum value with the location, and the maximum value with the location to the screen. You will read the data from a file into a dynamically allocated array of doubles. The size of the array to create will be read from the file. It is the first number in the file. The file you use for input will be the first argument on the command line (argv[1]). The file to use for output will be the second argument on the command line (argv[2]).

You must make sure I have given both filenames on the command line before opening the files. Check argc for the value of 3. If the file names were not provided, output a usage statement and exit the program. After opening the files, check that they were opened using the is_open() member function. If either file fails to open, output an error message and exit the program.

You will write a function that will fill the dynamic array with data from the file. The three parameters are the input file stream, an array of double that has already been dynamically allocated and the size of the array.

You will write a function that will return the location of the smallest data value in the array. The two parameters are the dynamically allocated array and the size of the array.

You will write a function that will return the location of the largest data value in the array. The two parameters are the dynamically allocated array and the size of the array.

Your functions calls will look like the following. You must name the three functions after the names below. You may not change the function calls in any way.

```
readData( fin, data, size );
minloc = minLocate(data, size);
maxloc = maxLocate(data, size);
```

Output to the screen:

```
Data set size is 7
The smallest data point is 33603.7 located at index 5
The largest data point is 951420 located at index 1
```

Output to the file:
The first number in the file will be the number of data values (size) on a line by itself.
The array will be outputted to the file with 5 numbers per line and will show 5 decimal places. A space will separate each data set value.

Example:
7
206631.58845 951419.65487 772106.54032 529300.42901 673978.88905
33603.65879 393893.39608

When you exit the program, close both files and free the arrays.

Your overall algorithm will be

1) Check for proper number of command line arguments.
2) Open files checking for success using the is_open function.
3) Allocate an array of double of the proper size.
4) Read the data into the array (call readData)
5) Find the minimum value in the array (call minLocate)
6) Find the maximum value in the array (call maxLocate)
7) Display data to screen.
8) Output values to the file.
9) Close files and free the array.

Make sure there is a commit message for each function at a minimum.
Follow the commit scheme of: hw6 – "MESSAGE"
Make sure you put the homework header at the top.

Dataset1.txt

Screen:

```
Data set size is 34987
The smallest data point is 10128.2 located at index 6854
The largest data point is 999936 located at index 4038
```

File:

```
34987
206631.58845 951419.65487 772106.54032 529300.42901 673978.88905
33603.65879 393893.39608 373918.68668 321482.48599 113363.66617
683692.89685 17732.07688 781892.34923 952569.08586 40386.41424
412550.67540 813518.60608 41907.04690 471706.78216 393711.96673
:
:
951530.59319 969837.95796 563610.35041 826427.46817 180679.72649
986445.66342 349427.20939 497358.24474 163028.69961 925370.09751
833195.60611 104858.12474
```

Dataset2.txt

Screen:

```
Data set size is 23
The smallest data point is 43349 located at index 1
The largest data point is 998429 located at index 3
```

File:

```
23
534977.10560 43348.95370 817337.70817 998429.38550 398461.34885
737028.03358 768175.06550 256469.92521 428687.46230 195009.91925
461250.62697 332083.96689 982211.70425 480170.23353 867823.73734
804164.89105 713814.89686 874674.10864 364221.69855 63501.09161
314409.41895 223845.84113 778242.53943
```