The goal of this lab is to help you get familiar with sorting data in an array.

Feel free to use the sample program discussed in the lecture as a starting point. That sample program can be found on *Moodle*: **Ch08_sample_code_SearchingSorting**.

Due Date

You must *demonstrate* the solution to this lab exercise to the instructor during class by

Saturday, October 10, 2020,

in order to receive full credit for this work.

Lab Setup

1. Create the project using Visual Studio.
2. Download the ZIP file for **Lab 8a** from Moodle.
3. Copy the sample input files, **`firstTen.txt`**, and **`presidents.txt`** from the Lab 8a ZIP file to the same folder where your source file is located.

Programming Exercise

This lab exercise involves writing a short program to do the following:

- Prompt the user for an input file name. Open this file for input. The file contains the names of people (one per line).
- Read the contents of the file into an array of **string** objects. (The maximum number of names for the array should be at least 50.)
- Display the input names, in the order they appear in the file.
- Modify the selection sort algorithm from the textbook so that it works with **string** objects, instead of integers. (This may require some research: check the textbook index and/or **www.cplusplus.com**.)
- Display the sorted list.

Add Descriptive Output Statements

Add code to the selection sort that describes each **swap** operation that the algorithm executes. The format of each line of this output should be:

`Swap [`*indexA***`]`** *stringA* **`with [`***indexB***`]`** *stringB*

(The sample output on the following pages illustrates this output.)

Sample Data Files

The ZIP file for this lab exercise contains two sample data files, which can be used to test your program:

Input file: firstTen.txt

```
Washington, George
Adams, John
Jefferson, Thomas
Madison, James
Monroe, James
Adams, John Quincy
Jackson, Andrew
Van Buren, Martin
Harrison, William Henry
Tyler, John
```

The program output for **firstTen.txt** is shown below. (In this example, the text that the user types is shown in **BOLD** font. The actual input / output will all be displayed in the same font.)

Output from processing the firstTen.txt file

```
Enter name of input file: firstTen.txt
10 lines of text read from input file.
Here are the unsorted names:
--------------------------
[ 0] Washington, George
[ 1] Adams, John
[ 2] Jefferson, Thomas
[ 3] Madison, James
[ 4] Monroe, James
[ 5] Adams, John Quincy
[ 6] Jackson, Andrew
[ 7] Van Buren, Martin
[ 8] Harrison, William Henry
[ 9] Tyler, John
Swap [ 1]               Adams, John with [ 0]        Washington, George
Swap [ 5]        Adams, John Quincy with [ 1]        Washington, George
Swap [ 8]   Harrison, William Henry with [ 2]         Jefferson, Thomas
Swap [ 6]           Jackson, Andrew with [ 3]            Madison, James
Swap [ 8]         Jefferson, Thomas with [ 4]             Monroe, James
Swap [ 6]            Madison, James with [ 5]        Washington, George
Swap [ 8]             Monroe, James with [ 6]        Washington, George
Swap [ 9]               Tyler, John with [ 7]         Van Buren, Martin
Swap [ 9]         Van Buren, Martin with [ 8]        Washington, George

Here are the names sorted:
--------------------------
[ 0] Adams, John
[ 1] Adams, John Quincy
[ 2] Harrison, William Henry
```

Output from processing the firstTen.txt file

```
[ 3] Jackson, Andrew
[ 4] Jefferson, Thomas
[ 5] Madison, James
[ 6] Monroe, James
[ 7] Tyler, John
[ 8] Van Buren, Martin
[ 9] Washington, George

C:\CSC237\Lab\Lab08a_SelectionSort\Lab08a_SOLUTION\Debug\Lab08a_SOLUTION.exe
(process 15740) exited with code 0.
```

The second sample data file, **presidents.txt**, contains the names of all U.S. Presidents. (This file and its associated text output are too large to include in the lab document.)

Demonstrate the Working Program to the Instructor

Demonstrate the working program to the instructor.

Be sure to save a copy of the source file in a safe place for future reference.