**Assignment 3 Zip Code (Version1)**

**Due Date: 11:50 pm on October 10, Monday**

### Objectives:

Students will

1. apply structured principles and good practices to the task of developing software systems.
2. communicate both technical and non-technical aspects of their work in formal and informal situations.

### Problem Description:

In this group project, you will process sequentially a CVS file using a buffer class.

### Requirements

1. Create a CSV (comma separated) file from the Zip Code CSV file *us\_postal\_codes.xlsx* posted under the **Assignments** folder on D2L.
2. Write a **buffer class** which can read and gather a Zip Code **Record** from the Zip Code CSV file. Define each class in a header file (*className.h*) and implement the member functions in an implementation file (*className.cpp*).
3. Write an application program using the **buffer** class that uses the CSV data file to generate a table comprising an alphabetical listing of state (two character) IDs, one state per row, where for each row the Easternmost (least longitude), Westernmost (greatest longitude), Northernmost (greatest latitude), and Southernmost (smallest latitude) Zip Code in that state is listed, in that order. The generated table must have an appropriate header row displaying labels describing each column, and be directed to the standard output.

You must design appropriate functions and use them in the main function. It is a poor practice to put everything in the main function.

1. Document (*extensively*) your C++ source code with comments and Doxygen tags.
2. Use the Doxygen literate programming system to create a **PDF** document for all of your classes and application program code. Your PDF document must include:

* all reasonably applicable tags
* UML diagrams
* class dependency graphs
* links to the source code for each file

1. Show that this application produces identical results when you use another spreadsheet column/field (other than Zip Code) for sorting the rows before generating a CSV file.
2. Test all of the source programs to your account in **centOS** system to make sure they work correctly before submitting to D2L.

### What to Hand In

For each group, please submit **ONE COPY** of the following documents to the drop box “Project2” on D2L:

* the CSV file
* the Doxygen PDF
* the C++ source files for all programs (please zip all of your source files).
* the script file that was generated to demonstrate the running of the application program for the data sorted by Zip Code.
* the script file that was generated to demonstrate the running of the application program for the data sorted by another column/field.

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| **Grading Scheme** | **points** |
| the CSV file | 10 |
| The PDF document generated by the Doxygen | 50 |
| C++ Source files for all programs | 40 |
| the script file that was generated to demonstrate the running of the application program for the data sorted by Zip Code. | 30 |
| the script file that was generated to demonstrate the running of the application program for the data sorted by another column/field | 20 |
| **TOTAL POINTS** | **150** |