

## COSC 2336.S01 PROGRAM ONE

### ASSIGNMENT:

Create a template class (named UBArray for UnBounded Array), which will have the following capabilities:

- 1) Two template arguments will be used
  - a) The first will be the data type to be stored
  - b) The second is the data type of the index of the array (default to integer)
- 2) Allow an unlimited number of elements
- 3) Elements will not be created unless they are used
- 4) In addition to the usual constructors, destructor, and assignment operator, implement the following
  - a) A subscript operator []
  - b) A function **At**, which will operate in the same way as the subscript operator
  - c) A function **Remove**, which will remove the element with the index value passed
  - d) A function **Size**, which will return the number of elements in the array
  - e) A set of iterator functions
    - i) **GetFirst** to return the first element in the array
    - ii) **GetLast** to return the last element in the array
    - iii) **GetNext** to return the next element in the array
    - iv) **GetPrev** to return the previous element in the array
  - f) The iterator functions will throw exceptions when no appropriate index exists
    - i) **ArrayEmpty** when no elements exist
    - ii) **NoNextElement** when no more elements follow
    - iii) **NoPrevElement** when no elements precede

A test program must be written which shows all functionality using in one case a string as data type and an integer as the index type. A second case will show a class consisting of multiple data elements as the data type and a string as the index type.

### TURN IN:

- 1) An electronic copy of the .cpp and .h files in the project folder as created by Visual Studio. This will be emailed to the instructor with the subject line "COSC 2336.S01 – Program 1".
- 2) If you wish any feedback on your work, turn in a printed listing of the .cpp and .h files that you created.

**DUE:** 14 Sep 2017