**Project-4**

**Objective:**

The purpose of this project is to expose you to:

Classes, objects, data members, member functions, and header files.

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**Problem Specification:**

Design a class that will do the following:

* Accept a student’s name (string) and maintains an array of test scores which might be an integer, a float or a double.
* If there is room you can **add** a score at the first available position. That is the position immediately following the last added score. If the array is empty, you add at the first position. If the array is full, then you cannot add and must indicate that. The function add () is a boolean function that returns **true** when an item is added , otherwise it returns a **false**.
* If there are scores in the array, you can **remove** the last score; scores in the middle or front may not be removed. If the array is empty then you cannot remove and must indicate that. The function **remove ()** is a boolean function that returns **true** when an item is removed , otherwise it returns a **false**.
* You can also **clear** the array of all the scores, but before you do that you must call a private function **print ()** which will print the name then the scores in reverse order, that is the scores last to first..

**Requirements:**

* Create a CRC card as explained in chapter 1.
* Specify each method’s purpose, describe its parameters, and write a pseudo-code version of its header as explained in chapter 1.
* Create a class diagram showing the class name, public and private members.
* You are to create a header file that contains the class declaration and interface for the class that will maintain objects of the class.
* You are to define a default constructor that will ask for a student name to be entered from the keyboard and stores it. It also initializes a counter that keeps track of the number of scores in the array and is maintained when you add, remove, or clear.
* You have to define a null destructor.
* The maximum number of test scores is 5 and is stored in the class data as a static constant.
* The test scores may be integers, floats or doubles.
* Two methods are defined to determine if the arrayscores **isFull** or **isEmpty.**

The file “proj4.cpp” is the client file that tests the methods defined in the implementation file and declared in the header file called “proj1.h”

**Grading Criteria:**

5 points a header file is used to define the class.

5 points a C++ implementation file contains member functions definitions.

5 points default constructor is defined and performs its task.

5 points destructor is defined and is null.

10 points class templates are used to accommodate different types.

5 points the preprocessor directive #ifndef is properly used.

5 points all accessor methods are constants and parameters passed are also constants

5 points Good programming practices: Proper spacing, comments, use of variables, indentations and appearance of program.

10 points methods specifications and pseudopod.

5 points CRC card is submitted correct and complete.

5 points a UML class diagram is submitted and is correct.

10 points the clear method calls the print function which prints the array elements last to first before clearing the array.

20 points Program solution fits specifications.

5 points test results for multiple runs.

**Submission Details:**

Hand-in a zipped folder with all the required files and test results.

Due Date 04-14-2021