**Project 1 -** CSC 402/502

Student Report Card with Logging

The goal of this project is for you to practice designing and implementing a class in C++, and implementing and using the Singleton design pattern. You are to design and implement a Student class, as well as a Logger class implemented as a Singleton. Then you will write some client tests in main() to demonstrate the output.

#### Student Class

* You need to implement the big three: Destructor, Copy Constructor, and operator=.
* Your class needs to provide the following data members:
  + Id, int, try to make this unique
  + Name, string
  + Marks, vector<int>, valid values are 0-100 (assume equal weight)
* Your class needs to provide the following member functions:
  + int calculateGrade(), returns a value from 0-100
  + string calculateLetterGrade(), returns a string representation of the NKU letter grade (A+, B-, etc).
  + string printReport(), returns a string report
  + Standard Accessors and Mutators, and any private helper functions
* Each class must use the same instance of your logger, in each method, to print to the command line what the return value of the method will be.

Logger Class

* You need to make this a proper singleton.
* Your class needs to provide the following member function:
  + void log(string output), prints the contents to cout.

main()

* You need to devise a set of “tests” in main() to exercise both the Student class and your Logger singleton. I will leave how you test up to you, but I expect a certain minimum amount of rigor in testing the code inside of the Student Class. I will have additional tests that I will use to evaluate your implementation.
* The same logger should log inside of each Student class, as well as the tests.

#### Submission

You need to put the class implementations, the class declarations, and the client code in their respective files. You need to use proper macros to avoid including the same .h more than once. Also, you need to submit a text file or equivalent explaining your tests. Please zip your files project and name your submission file as ***your\_username*-project1.zip**. Please submit your zip file on Blackboard by the due date. This is an **individual** project. The submitted code needs to be in a CLion project. Each day that the project is late will result in a 5% reduction on the grade for the project. No projects will be accepted more than one week late.