

Fall, 2022

Huge Integer

100 points

- **Problem 1 (20 pts)**

Declare a 2D array to store a 3x4 array of integers between 1 and 9, and then implement a function that counts the frequency of each element (i.e., how many times each element is repeated).

- **Problem 2 (60 pts)**

Define a class Number which acts as *int* (integer) but for which the following operations are allowed: +, -, *, /, ++ and -- (with the same semantics as for int). The class should be defined in its' own header file and the implementation of the class should be contained in its' own source file. Upon completion, this class should have the following data members and member functions:

- number, the int variable used to represent the numerical integer
- input() >>
- output() <<
- add() +
- isEqualTo() ==
- isNotEqualTo() !=
- isGreaterThanEqualTo() >=
- isLessThanEqualTo() <=
- isZero()
- increment() ++
- decrement() --
- multiply() *
- divide() /

- **Problem 3 (20 pts)**

Write a C++ program to implement the matrix ADT using a class. The class should be defined in its own header file and the implementation of the class should be contained in its own source file. The following operations must be supported by this class:

- Two-dimensional float array (data member)
- Filling a matrix
- Printing a matrix
- Matrices addition
- Matrices multiplication

Submission:

Upload your source files (.cpp and .h), including the test driver, using 'Homework 1' link on Blackboard.