Lab Assignment 5
Matrix – Part 2

CS 361 – Principles of Programming Languages I

Fall 2021

In the previous lab, we started implementing a class `Matrix`. We implemented some basic constructors, the destructor, a resize function, and an operator to access and modify the elements of the matrix. This week, we continue implementing more members.

Assignment

You are given a header file *matrix.h* declaring a class `Matrix` with various members which are described below. Write a file *matrix.cpp* which implements the class. You can use your implementation from Lab 4 or the file provided on Canvas as starting point. Do not add any additional public methods. You are, however, allowed to add private methods to avoid redundancy in your code. We will add more members in future labs.

The Class `Matrix`

Implemented in Lab 4

- `Matrix()`
- `Matrix(int size)`
- `Matrix(int height, int width)`
- `~Matrix()`
- `int getWidth()`, `int getHeight()`
- `void resize(int height, int width)`
- `long& operator()(int row, int col)`
- `int width`, `int height`, `long** values`

Constructors and Destructor

`Matrix(Matrix&)`: Copy constructor.
`Matrix(Matrix&&)`: Move constructor.

Methods

`void transpose()`: Changes the matrix to its transposition. Note that it changes the matrix and does *not* create a new `Matrix`-object.

$$\begin{bmatrix}1&2\\4&3\\5&6\end{bmatrix}\texttt{.transpose()} = \begin{bmatrix}1&4&5\\2&3&6\end{bmatrix}$$

Operators

`Matrix& operator=(Matrix&):` Copy assignment.
`Matrix& operator=(Matrix&&):` Move assignment.

`bool operator==(Matrix&):` Determines if two matrices are equal. Two matrices are equal if they have the same height, the same width, and all corresponding elements are equal in both matrices.

Submission

For your submission, upload a single zip-file to Canvas. The zip-file should contain

- a file *matrix.cpp* and
- a file *matrix.h* if you added additional private methods.

This is an individual assignment. Therefore, a submission is required from each student.

Deadline: Sunday, October 31, 11:59 pm.