University of Central Punjab
Faculty of Information Technology

PF Project

Matrix Manipulator

Project:

You are required to create a program that provides near-complete functionality over the matrix space. Users should be given a simple and smooth work flow that implements following details according to specs:

Front end:

- User can enter matrix personally or though files of their choosing
- User can get output on console or through files of their choosing
- Program should not end until user wishes to end their task
- User can enter Matrix of any size
- In case of file data entry each file will contain single matrix and you must use auto-grow techniques to read data

Functional Requirements:

- Sum of Matrix (sum of all values)
- Product of Matrix (product of all values)
- Row-wise Average
- Column-wise Average
- Average or whole Matrix

- Row-wise sorting of Matrix
- Column-wise sorting of Matrix
- Addition of two Matrices
- Subtraction of two Matrices
- Matrix transpose

Back end:

- Use separate function for every task listed above that is controlled by menu function which guides users through the various options
- Use separate functions for helping tasks such as file input/output
- Handle any and all sanity checks such as “size < 1”
- In case there are any operations the program cannot perform, show a proper error message on screen to user to clearly state what is wrong with the input
- Code should be thoroughly commented with appropriate details
- There should be no memory leakage at all throughout the program
- All code must be 100% generic

Useful links:

- https://www.shelovesmath.com/algebra/advanced-algebra/matrices-and-solving-systems-with-matrices/
- https://en.wikipedia.org/wiki/Matrix_(mathematics)
- https://www.khanacademy.org/math/algebra-home/alg-matrices
- https://www.mathsisfun.com/algebra/matrix-introduction.html
- https://courses.lumenlearning.com/boundless-algebra/chapter/introduction-to-matrices/
- http://mathworld.wolfram.com/Matrix.html