


De La Salle University
Computer Technology Department

Laboratory for Computer Organization and Architecture

LBYARCH 2023-2024 Term1

Machine Project 1

Task

Develop a RISCV program that performs matrix transpose upon a user provided input. Implement your program using the RARS Software. Values must use floating point representation.

Matrix Transpose

Matrix Transpose is an operation that transforms the row elements of the matrix into column elements. An example is provided below where A is the input matrix and A^T is the transpose of A.

$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$	$A^T = \begin{bmatrix} 1 & 3 & 5 \\ 2 & 4 & 6 \end{bmatrix}$

Input Format

Inputs provided are the size and the elements of the matrix. Suppose the input is Matrix A from the above example. Wherein Matrix A is a 3x2 Matrix. The input would have been:

```
3
2
1.0
2.0
3.0
4.0
5.0
6.0
```

Wherein the first input is the rowsize, second input is the columnsize and the succeeding inputs are the elements of the matrix from left to right and top to bottom.

Output Format

The output is the transpose of the matrix. An example output is shown below:

```
1.0   3.0   5.0
2.0   4.0   6.0
```

Submission

Submit a working RISCV code of the filename LBYARCH-SEC-GRP-MP01-LASTNAMES.asm (example. LBYARCH-S16-G4-MP01-DelaCruzPedro.asm). Together with a screenshot with your test case displaying that your code works. Screenshot file names follows the format LBYARCH-SEC-GRP-MP01-Screenshot-LASTNAMES.jpg. Submit all the files compressed using the .zip format