* outcome:
  1) Transpose of a matrix
  2) Result of addition, substraction and Multiplication of two matrix

* Theory
  2 dimension array
→ 2-D array are data structures that organize element in a tabular formate similar to a spreadsheet. They consists of rows and columns where each element
i) identified by it's row index & column

1) Row - major order

$$index = (i * num\ cols) + j$$

Where num cols is the number of column in the array

2) column Major order

$$index = (j * num\ Rows) + i$$

Where num Rows is the number of rows in the array

Matrix operation

1) Addition
To add two matrix their dimensions must be the same The sum obtained by adding corresponding element of the two
eg

$$A=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix} \qquad B=\begin{bmatrix}5 & 6\\ 7 & 8\end{bmatrix}$$

$$A+B=\begin{bmatrix}6 & 8\\ 10 & 12\end{bmatrix}$$

2) Substraction
substraction of matrix is similar to addition, where corresponding element are substracted

$$A=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix} \qquad B=\begin{bmatrix}5 & 6\\ 7 & 8\end{bmatrix}$$

$$A-B\begin{bmatrix}-4 & -4\\ -4 & -4\end{bmatrix}$$

3) Multiplication
To multiply two matrix A(m×n) and B (m×
The number of column in A must be equal to the number of rows in B The resul product matrix will have dimensional m×p

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \qquad B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$$

$$A \times B \begin{bmatrix} 14 & 22 \\ 45 & 50 \end{bmatrix}$$

5) Transpose of matrix

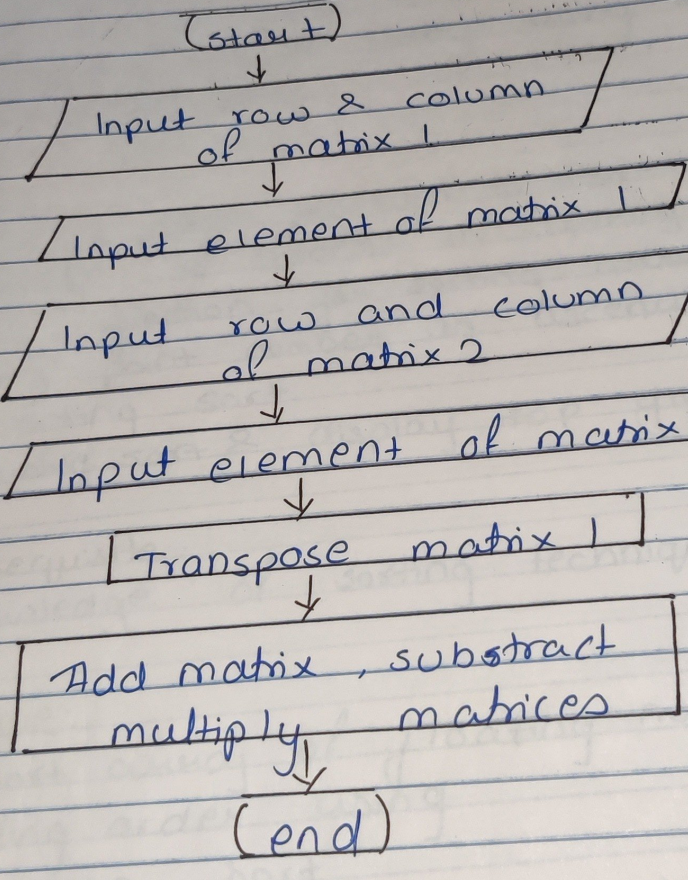
The transpose of a matrix is obtained by interchanging it's row and column if A is an $n \times n$ matrix it's transpose A^T will be an $n \times m$ matrix

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

* Algorithm:

step 1) start
step 2) Input number of row & column of first matrix
step 3) Input element of first matrix
step 4) Input number of row & column of second
step 5) Input element of second matrix
step 6) function to transpose first i.e the element at row column C in the original is placed at row column r of the transpose
step 7) function to add - substract and multiply two matrix
step 8) stop.

* Flowchart



* Conclusion

By this way we can perform various operation on matrix successfully.