

1 in [1, 2, 5, 3] \rightarrow True

Dt
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in is by default keyword in python.

min [1, 2, 3, 4, 5] # 1

max [1, 2, 3, 4, 5] # 5

sum [1, 2, 3] \rightarrow # 6

MATRIX

matrix = [[1, 2, 3], [4, 5, 6], [7, 8, 9]]

matrix [2][0]

matrix [0] [0] [1] [2] \rightarrow [1, 2, 3]

[1] [0] [1] [2] \rightarrow [4, 5, 6]

[2] [0] [1] [2] \rightarrow [7, 8, 9]

Matrix [row][column]

1	2	3
4	5	6
7	8	9

* All the Arithmetic operations are applicable on the Matrix.

- 1) Transpose
- 2) Multiplication
- 3) Division
- 4) Addition
- 5) Determinant
- 6) Subtraction

All the list applications are possible.

Eg: $A = \begin{bmatrix} 1, 4, 5, 12 \\ -5, 9, 0 \\ -6, 7, 8, 9 \end{bmatrix}$

print ("A" = "a") \rightarrow Print whole thing

$A[1] \rightarrow$ 2nd row

$A[1][2] \Rightarrow$ 2nd row 3rd element

$A[0][-1] \Rightarrow$ 1st row last element

Column = []:

for row in A:

Column.append(row[2])

print (Column) $\rightarrow [5, 9, 8]$

↳ NumPy provides multidimensional Array of Numbers (which is actually an object)

Transposing

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

Interchanging rows & Columns

$$A = \text{result} \rightarrow \begin{bmatrix} [0, 0, 0] \\ [0, 0, 0] \end{bmatrix}$$

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

$$\begin{matrix} n & m \\ 2 & 3 \end{matrix} \longleftrightarrow \begin{matrix} m & n \\ 3 & 2 \end{matrix}$$

$$\text{result/output} \Rightarrow \boxed{3 \times 2}$$

$$\text{result} = \begin{bmatrix} 0 & 0 \\ 0 & 0 \\ 0 & 0 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 4 \\ 2 & 5 \\ 3 & 6 \end{bmatrix}$$

Range

extend,

reverse,

append,

Min

Max

All the functions are applicable
Methods are applied in python

add() → function is used to perform
element wise matrix addition

Subtract() multiply() sqrt()
divide() dot() sum(x, axis)

By using numpy (Additional library)

```
rows = int(input('rows'))
cols = int(input('columns'))
```

matrix =

```
for i in range(rows)
```

a = [] → creating new empty list

```
for j in range(cols)
```

```
    a.append(int(input()))
```

```
matrix.append(a)
```

for i in range(R):

for j in range(Col):

print(matrix[i][j], end=" ")

print()

matrix = [[int(input()) for x in range(C)]
for y in range(R)]

print(matrix)