March 23, 2022

import numpy as np

Transpose

```
x = np.array([[1,2,3],[4,5,6]])   # matrix 2d array.
```

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

2 x 3

transpose

```
y = np.transpose(x)
```

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

3 x 2

Reshape → change dimension.

No of elements must be the same.

reshape

```
z = x.reshape(1,6)
z = [[1,2,3,4,5,6]]
```

No of elements in x = No of elements in z

Joining

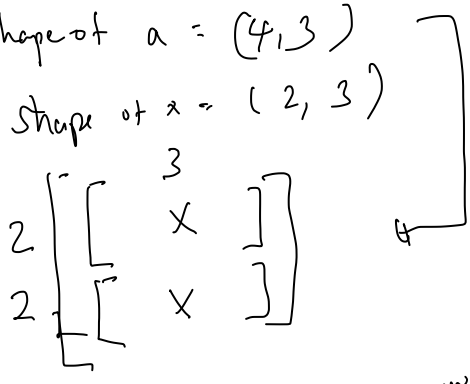
- Concatenate : Joins an array along existing axis
- Stack : joins an array along a new axis.

Concatenate

```
a = np.concatenate([a, x], axis=0)
```

Shape of a = (4, 3)

Shape of x = (2, 3)



Stack

Stack on a new axis vertically

```
b = np.stack([x, x], axis=0)
```

Shape of b = (2, 2, 3)

new axis added

2 blocks with 2 rows and 3 columns

x moved from 2d array to 3d array.

Adding a dimension

axis 1

```
c = np.expand_dims(x, 1)
```

c.shape = (2, 1, 3)

```
c = [[[1 2 3]]
     [[4 5 6]]]
```

↑ 2 blocks with 1 row and 3 elements each.

The number of elements must be the same.

Removing a dimension

```
d = np.squeeze(c, 1)
```

The dimension of d reduces. d is (2, 3)