Linear Algebra

```python
In [1]: import numpy as np
        import pandas as pd
        from numpy import linalg as la
```

```
one dimesional array creation
```

```python
In [2]: one=np.array([1,2,3])
        one
```

```
Out[2]: array([1, 2, 3])
```

two dimesional array creation

```python
In [3]: two=np.array([[1,2,3],[4,5,6]])
        two
```

```
Out[3]: array([[1, 2, 3],
               [4, 5, 6]])
```

three dimesional array creation

```python
In [4]: three=np.array([[1,2,3],[4,5,6],[7,8,9]])
        three
```

```
Out[4]: array([[1, 2, 3],
               [4, 5, 6],
               [7, 8, 9]])
```

```
four dimesional array creation
```

```python
In [5]: four=np.array([[1,2,3],[4,5,6],[7,8,9],[10,11,12]])
        four
```

```
Out[5]: array([[ 1,  2,  3],
               [ 4,  5,  6],
               [ 7,  8,  9],
               [10, 11, 12]])
```

five dimesional array creation

```
In [25]: five=np.array([[1,2,3],[4,5,6],[7,8,9],[10,11,12],[13,14,15]])
         five
```

```
Out[25]: array([[ 1,  2,  3],
               [ 4,  5,  6],
               [ 7,  8,  9],
               [10, 11, 12],
               [13, 14, 15]])
```

Determinent of three D

```
In [7]: print(la.det(three))
```

```
-9.51619735392994e-16
```

Functions on two D array

```
In [9]: print(np.trace(two))
        print(la.matrix_rank(two))
        print(np.diag(two))


        two.T
```

```
6
2
[1 5]
```

```
Out[9]: array([[1, 4],
               [2, 5],
               [3, 6]])
```

Functions on three D array

In [22]:
```python
print(np.trace(three))
print(la.matrix_power(three,0))
print(la.matrix_rank(three))
print(np.diag(three))
print(la.inv(three))
three.T
```

```
15
[[1 0 0]
 [0 1 0]
 [0 0 1]]
2
[1 5 9]
[[ 3.15251974e+15 -6.30503948e+15  3.15251974e+15]
 [-6.30503948e+15  1.26100790e+16 -6.30503948e+15]
 [ 3.15251974e+15 -6.30503948e+15  3.15251974e+15]]
```

Out[22]:
```
array([[1, 4, 7],
       [2, 5, 8],
       [3, 6, 9]])
```

Functions on four D array

In [29]:
```python
print(np.trace(four))

print(la.matrix_rank(four))
print(np.diag(four))

four.T
```

```
15
2
[1 5 9]
```

Out[29]:
```
array([[ 1,  4,  7, 10],
       [ 2,  5,  8, 11],
       [ 3,  6,  9, 12]])
```

Functions on five D array

In [26]:
```python
print(np.trace(five))
print(la.matrix_rank(five))


print(np.diag(five))

five.T
```

```
15
2
[1 5 9]
```

Out[26]:
```
array([[ 1,  4,  7, 10, 13],
       [ 2,  5,  8, 11, 14],
       [ 3,  6,  9, 12, 15]])
```

Eigen values on three dimensional

In [28]:
```python
print(la.eig(three))
```

```
(array([ 1.61168440e+01, -1.11684397e+00, -3.38433605e-16]), array([[-0.23197
069, -0.78583024,  0.40824829],
       [-0.52532209, -0.08675134, -0.81649658],
       [-0.8186735 ,  0.61232756,  0.40824829]]))
```

In [19]:
```python
print(la.eigvals(three))
```

```
[ 1.61168440e+01 -1.11684397e+00 -3.38433605e-16]
```

In [ ]:

In [ ]:

In [ ]:

In [ ]: