

rank of matrix

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1 Rank of a Matrix

```
[ ]: from numpy.linalg import matrix_rank
```

```
i = np.eye(4)

print(i)

r = matrix_rank(i)

print("rank = ",r)
```

```
[[1. 0. 0. 0.]
 [0. 1. 0. 0.]
 [0. 0. 1. 0.]
 [0. 0. 0. 1.]]
rank = 4
```

```
[ ]: i = np.eye(4)
i[3,3] = 0

print(i)
r = matrix_rank(i)

print("rank = ",r)
```

```
[[1. 0. 0. 0.]
 [0. 1. 0. 0.]
 [0. 0. 1. 0.]
 [0. 0. 0. 0.]]
rank = 3
```

```
[ ]: from numpy.linalg import matrix_rank
```

```
i = np.ones((4,4))

print(i)
r = matrix_rank(i)
```

```
print("rank = ",r)
```

```
[[1. 1. 1. 1.]
 [1. 1. 1. 1.]
 [1. 1. 1. 1.]
 [1. 1. 1. 1.]]
rank = 1
```

```
[ ]: p = np.matrix([[1,1,-1],[2,-3,4],[3,-2,3]])
      q = np.matrix([[-1,-2,-1],[6,12,6],[5,10,5]])
```

```
print(p+q)
r = matrix_rank(p+q)

print("rank = ",r)
```

```
[[ 0 -1 -2]
 [ 8  9 10]
 [ 8  8  8]]
rank = 2
```

```
[ ]: b = np.matrix([[2,-1,3],[1,0,1],[1,1,4]])
```

```
print(b)
r = matrix_rank(b)

print("rank = ",r)
print()
bt = np.transpose(b)

print(bt)
r = matrix_rank(bt)

print("rank = ",r)
```

```
[[ 2 -1  3]
 [ 1  0  1]
 [ 1  1  4]]
rank = 3
```

```
[[ 2  1  1]
 [-1  0  1]
 [ 3  1  4]]
rank = 3
```

```
[ ]: #show rank of p is no of non zero eigen values
      p = np.matrix([[1,1,-1],[2,-3,4],[3,-2,3]])
```

```
print(p)
r = matrix_rank(p)

print("rank = ",r)

eig = np.linalg.eigvals(p)

print("eigen values : ",eig)
```

```
[[ 1  1 -1]
 [ 2 -3  4]
 [ 3 -2  3]]
rank = 2
eigen values : [ 1.00000000e+00+0.00000000e+00j -2.24492778e-16+4.40332636e-08j
 -2.24492778e-16-4.40332636e-08j]
```