In [1]:
```
import numpy

# initializing matrices
x = numpy.array([[1, 2], [3, 4]])
y = numpy.array([[5, 6], [7, 8]])
print("Given matrix:")
print(x)
# using multiply() to multiply matrices element wise
print ("The element wise multiplication of matrix is : ")
print (numpy.multiply(x,y))
# using dot() to multiply matrices
print ("The product of matrices is : ")
print (numpy.dot(x,y))
# using "T" to transpose the matrix
print ("The transpose of given matrix is : ")
print (x.T)
# using "trace" to find trace of the matrix
print ("The trace of given matrix is : ")
print (x.trace())
#Rank of matrix
print(numpy.linalg.matrix_rank(x))
#Determinant of matrix
print(numpy.linalg.det(x))
#Inverse of matrix
print(numpy.linalg.inv(x))
#Eigen values of matrix
print(numpy.linalg.eig(x))
```

```
Given matrix:
[[1 2]
 [3 4]]
The element wise multiplication of matrix is :
[[ 5 12]
 [21 32]]
The product of matrices is :
[[19 22]
 [43 50]]
The transpose of given matrix is :
[[1 3]
 [2 4]]
The trace of given matrix is :
5
2
-2.0000000000000004
[[-2.   1. ]
 [ 1.5 -0.5]]
(array([-0.37228132,  5.37228132]), array([[-0.82456484, -0.41597356],
       [ 0.56576746, -0.90937671]]))
```

In [2]:
```
import numpy as py
a=py.array([[2,4,5],[1,2,3],[4,3,2]])
u,d,vt=py.linalg.svd(a)
ar=(u@py.diag(d)@vt)
print(u)
print(d)
print(vt)
print(ar)
```

```
[[-0.73374256 -0.43980292 -0.5178757 ]
 [-0.40369546 -0.33087851  0.85296506]
 [-0.54649047  0.83492083  0.06523321]]
[9.00547772 2.61847489 0.21203855]
[[-0.4505194  -0.59761766 -0.66323856]
 [ 0.8131447   0.03200098 -0.58118125]
 [ 0.36854847 -0.80114235  0.47153257]]
[[2. 4. 5.]
 [1. 2. 3.]
 [4. 3. 2.]]
```

In [ ]: