In [1]:
```
import numpy as np
from scipy import linalg as la
```

In [3]:
```
##Question1

v=np.array([2,-1,4])
u=np.array([-2,1,5])
a=-2
normv=la.norm(v,1)
print(normv*v+a*u)
```

```
[18. -9. 18.]
```

In [4]:
```
##Question2
Cosine_Theta=(np.dot(v,u)/(la.norm(v,2)*la.norm(u,2)))
print('Cosine Theta = ',round(Cosine_Theta,3))
print('Angle  [rad] = ',round(np.arccos(Cosine_Theta)/np.pi,3),'pi')
```

```
Cosine Theta =  0.598
Angle  [rad] =  0.296 pi
```

In [36]:
```
##Question3
A=np.matrix([[0,3,-1],
             [-1,4,-2],
             [1,3,1]])
v1=np.array([2,-1,4])
v1=v.reshape(3,1)
Answer3=a*(A*v1)
print(Answer3)
```

```
[[14]
 [28]
 [-6]]
```

In [54]:
```
##Question4
B=np.matrix([[2,-1,2],[-1,0,1],[-1,2,2]])
A@B.transpose()+B.A.trace()*la.tril(B)
```

Out[54]:
```
matrix([[  3,  -1,   4],
        [-14,  -1,   5],
        [ -3,   8,  15]])
```