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

In [2]:
```
v = np.array([2,-1,4])
u = np.array([-2,1,5])
a = -2
b =1
A = np.array([[0,3,-1],[-1,4,-2],[1,3,1]])
B = np.array([[2,-1,2],[-1,0,1],[-1,2,2]])
```

In [3]:
```
#Question 1
print('L1 Norm = ',la.norm(v,1))
print('Question 1 = ',la.norm(v,1)*v+a*u)
```

```
L1 Norm =  7.0
Question 1 =  [18. -9. 18.]
```

In [5]:
```
#Question 2
Cosine_Theta = (np.dot(u,v)) / (la.norm(u,2)*la.norm(v,2))
print('L2 of u =',la.norm(u,2))
print('L1 of v =',la.norm(v,2))
print('Dot Product = ',np.dot(u,v))
print('Cosine Theta = ',Cosine_Theta)
```

```
L2 of u = 5.477225575051661
L1 of v = 4.58257569495584
Dot Product =  15
Cosine Theta =  0.5976143046671969
```

In [6]:
```
#Question3
a_A_dot_v = a*np.matmul(A,v)
print('a*(A dot v) = ',a_A_dot_v)
```

```
a*(A dot v) =  [14 28 -6]
```

In [8]:
```
#Question4
Q4 = np.dot(A, B.transpose())+ B.trace()*la.tril(B)
print('Question 4 = \n', Q4)
```

```
Question 4 =
 [[  3  -1   4]
 [-14  -1   5]
 [ -3   8  15]]
```

In [ ]:
```

```