In [3]:
```python
import numpy as np
sum=np.zeros((3,3))
A=np.matrix([[1,1,2],[9,2,0],[5,0,3]])
p=np.poly(A)
print("Characteristic polynomial for\n",A,"\nis\n",p)
for i in range(0,len(p)):
    sum=sum+round(p[len(p)-(len(p)+(i+1))])*(A**i)
print("since the sum of the above statement is zero matrix, thus caley hamilto
n theorem is verified",sum)
```

```
Characteristic polynomial for
 [[1 1 2]
 [9 2 0]
 [5 0 3]]
is
 [ 1. -6. -8. 41.]
since the sum of the above statement is zero matrix, thus caley hamilton theo
rem is verified [[0. 0. 0.]
 [0. 0. 0.]
 [0. 0. 0.]]
```

In [29]:
```python
###To take user defined matrix
```

In [41]:
```python
import numpy as np
row=int(input("Enter the number of row of matrix"))
col=int(input("Enter the number of column of matrix"))
print("Enter",row*col,"elements when prompted")
a = np.zeros((row,col))
for i in range(row):
    for j in range(col):
        a[i][j] = float(input("Enter element"))
print(a)
```

```
Enter the number of row of matrix2
Enter the number of column of matrix2
Enter 4 elements when prompted
Enter element1
Enter element2
Enter element3
Enter element4
[[1. 2.]
 [3. 4.]]
```