Use sympy for basic operations in python Q.1)Using python code construct the following matrices a)An identity of 9 9 b)Zero matric of order 75 c)Ones matrix of order 6*4

In [1]:
```
from sympy import*
```

In [2]:
```
A=Matrix([[1,0,7],[2,1,6],[3,4,0]])
A
```

Out[2]:
$$\begin{bmatrix}1 & 0 & 7\\2 & 1 & 6\\3 & 4 & 0\end{bmatrix}$$

In [3]:
```
A.det()
```

Out[3]: $11$

Q2.Using sympy find the rank of a given matrix

In [4]:
```
A=Matrix([[2,5],[4,6]])
A
```

Out[4]:
$$\begin{bmatrix}2 & 5\\4 & 6\end{bmatrix}$$

In [5]:
```
A.rank()
```

Out[5]: 2

In [6]:
```
B=Matrix([[7,4,3],[6,3,5],[9,8,6]])
B
```

Out[6]:
$$\begin{bmatrix}7 & 4 & 3\\6 & 3 & 5\\9 & 8 & 6\end{bmatrix}$$

In [7]:
```
B.rank()
```

Out[7]: 3

Q3.Using sympy fint the transpose of a given matrix

In [8]:
```
A=Matrix([[5,3],[6,7]])
A
```

Out[8]:
$$\begin{bmatrix}5 & 3\\6 & 7\end{bmatrix}$$

In [9]:
```
A.T
```

Out[9]:
$$\begin{bmatrix}5 & 6\\3 & 7\end{bmatrix}$$

In [10]:
```
B=Matrix([[10,22,24],[45,4,2],[3,4,5]])
B
```

Out[10]:
$$\begin{bmatrix} 10 & 22 & 24 \\ 45 & 4 & 2 \\ 3 & 4 & 5 \end{bmatrix}$$

In [11]:
```
B.T
```

Out[11]:
$$\begin{bmatrix} 10 & 45 & 3 \\ 22 & 4 & 4 \\ 24 & 2 & 5 \end{bmatrix}$$

Q4.Find the row echelon form of a given matrix

In [12]:
```
A=Matrix([[2,3,4],[8,5,5],[9,8,6]])
A
```

Out[12]:
$$\begin{bmatrix} 2 & 3 & 4 \\ 8 & 5 & 5 \\ 9 & 8 & 6 \end{bmatrix}$$

In [14]:
```
A.rref()
```

Out[14]:
```
(Matrix([
 [1, 0, 0],
 [0, 1, 0],
 [0, 0, 1]]),
 (0, 1, 2))
```

In [15]:
```
B=Matrix([[4,8,9],[1,2,4],[3,4,6]])
B
```

Out[15]:
$$\begin{bmatrix} 4 & 8 & 9 \\ 1 & 2 & 4 \\ 3 & 4 & 6 \end{bmatrix}$$

In [16]:
```
B.rref()
```

Out[16]:
```
(Matrix([
 [1, 0, 0],
 [0, 1, 0],
 [0, 0, 1]]),
 (0, 1, 2))
```

In [ ]: