q1

```
A = randi([0, 20], 5, 5)
```

```
A = 5×5
     0    15     6    10    12
    20     0    11    19     0
     4     1     5     3     1
    12    19    11     8     6
     7     1    16     5     2
```

```
rank(A)
```

```
ans = 5
```

q2

a)

```
A = randi([0, 9], 5, 5)
```

```
A = 5×5
     1     1     8     0     0
     3     0     5     1     3
     0     4     0     9     4
     7     4     8     8     0
     6     2     4     6     5
```

```
B = randi([0, 9], 5, 5)
```

```
B = 5×5
     3     3     8     8     5
     4     5     4     4     9
     5     5     9     2     6
     0     2     5     9     6
     0     9     2     1     4
```

```
rank(A)
```

```
ans = 5
```

b)

```
rank(B)
```

```
ans = 5
```

c)

```
C=A+B
```

```
C = 5×5
     4     4    16     8     5
     7     5     9     5    12
     5     9     9    11    10
     7     6    13    17     6
     6    11     6     7     9
```

```
rank(C)
```

ans = 5

d)

```
C=A-B
```

```
C = 5×5
    -2    -2     0    -8    -5
    -1    -5     1    -3    -6
    -5    -1    -9     7    -2
     7     2     3    -1    -6
     6    -7     2     5     1
```

```
rank(C)
```

ans = 5

e)

```
C=A*B
```

```
C = 5×5
    47    48    84    28    62
    34    63    80    46    63
    16    74    69   101   106
    77    97   184   160   167
    46   105   132   123   128
```

```
rank(C)
```

ans = 5

F)

```
G=6*B
```

```
G = 5×5
    18    18    48    48    30
    24    30    24    24    54
    30    30    54    12    36
     0    12    30    54    36
     0    54    12     6    24
```

```
rank(G)
```

```
ans = 5
```

q 3)

a)

```
A = randi([0,9],5 ,5)
```

```
A = 5×5
      5     2     8     2     8
      9     4     3     1     5
      3     6     4     0     1
      2     5     5     8     4
      4     3     0     0     5
```

```
A(1,:) = zeros
```

```
A = 5×5
      0     0     0     0     0
      9     4     3     1     5
      3     6     4     0     1
      2     5     5     8     4
      4     3     0     0     5
```

```
a = A(3,5)
```

```
a = 1
```

b)

```
A=randi([0,9],5 ,5)
```

```
A = 5×5
      0     2     9     3     3
      9     8     5     0     5
      6     3     5     0     8
      4     9     9     8     4
      8     2     7     4     6
```

```
b = A(1,:)
```

```
b = 1×5
      0     2     9     3     3
```

c)

```
A=randi([0,9],5 ,5)
```

```
A = 5×5
     0     2     8     2     8
     3     2     7     8     4
     1     6     5     8     0
     2     7     9     3     7
     3     2     5     3     4
```

```
C = A([1,3], :)
```

```
C = 2×5
     0     2     8     2     8
     1     6     5     8     0
```

d)

```
A = randi([0,9],5 ,5)
```

```
A = 5×5
     2     7     6     0     0
     3     8     0     8     9
     3     2     9     6     4
     7     6     6     8     7
     0     2     3     5     1
```

```
d = A(:,2)
```

```
d = 5×1
     7
     8
     2
     6
     2
```

e)

```
A = randi([0,9],5 ,5)
```

```
A = 5×5
     8     7     1     6     9
     9     5     0     9     1
     7     5     5     9     3
     7     3     5     9     0
     4     7     5     6     5
```

```
E = A(:,[2,4])
```

```
E = 5×2
     7     6
     5     9
     5     9
     3     9
     7     6
```

4)

```
A = randi([0,9],9 ,9);
for i = 3:9
    A(i,:) = zeros;
end
A
```

```
A = 9×9
    7    8    7    1    8    3    3    3    0
    1    0    5    3    5    6    9    9    8
    0    0    0    0    0    0    0    0    0
    0    0    0    0    0    0    0    0    0
    0    0    0    0    0    0    0    0    0
    0    0    0    0    0    0    0    0    0
    0    0    0    0    0    0    0    0    0
    0    0    0    0    0    0    0    0    0
    0    0    0    0    0    0    0    0    0
```

```
B = A+transpose(A)
```

```
B = 9×9
   14    9    7    1    8    3    3    3    0
    9    0    5    3    5    6    9    9    8
    7    5    0    0    0    0    0    0    0
    1    3    0    0    0    0    0    0    0
    8    5    0    0    0    0    0    0    0
    3    6    0    0    0    0    0    0    0
    3    9    0    0    0    0    0    0    0
    3    9    0    0    0    0    0    0    0
    0    8    0    0    0    0    0    0    0
```

5)

a)

```
A = randi([0,9],10 ,5);
A([4,5,6,7,8,9,10],:) = zeros
```

```
A = 10×5
    7    7    6    9    5
    3    8    5    0    0
    5    0    0    8    1
    0    0    0    0    0
    0    0    0    0    0
    0    0    0    0    0
    0    0    0    0    0
    0    0    0    0    0
    0    0    0    0    0
    0    0    0    0    0
```

```
S1=A*transpose(A)
```

```
S1 = 10×10
   240  107  112    0    0    0    0    0    0    0
   107   98   15    0    0    0    0    0    0    0
   112   15   90    0    0    0    0    0    0    0
     0    0    0    0    0    0    0    0    0    0
     0    0    0    0    0    0    0    0    0    0
     0    0    0    0    0    0    0    0    0    0
```

```
    0      0      0      0      0      0      0      0      0      0
    0      0      0      0      0      0      0      0      0      0
    0      0      0      0      0      0      0      0      0      0
    0      0      0      0      0      0      0      0      0      0
```

```
S2=transpose(A)*A
```

```
S2 = 5×5
    83     73     57    103     40
    73    113     82     63     35
    57     82     61     54     30
   103     63     54    145     53
    40     35     30     53     26
```

b)

```
rank(S1)
```

```
ans = 3
```

```
S2
```

```
S2 = 5×5
    83     73     57    103     40
    73    113     82     63     35
    57     82     61     54     30
   103     63     54    145     53
    40     35     30     53     26
```

```
rank(S2)
```

```
ans = 3
```