In [8]:
```
import numpy as np
```

In [41]:
```
#QUESTION 1
U=np.array([[10**(-1),1],[7/12,0],[-0.7,0], [np.cos(100),0.2]])
print(U)
```

```
[[ 0.1         1.        ]
 [ 0.58333333  0.        ]
 [-0.7         0.        ]
 [ 0.86231887  0.2       ]]
```

In [42]:
```
#QUESTION 2
A=5*np.identity(4)+U.dot(U.T)
print(A)
```

```
[[ 6.01        0.05833333 -0.07        0.28623189]
 [ 0.05833333  5.34027778 -0.40833333  0.50301934]
 [-0.07       -0.40833333  5.49       -0.60362321]
 [ 0.28623189  0.50301934 -0.60362321  5.78359384]]
```

In [43]:
```
#QUESTION 3
b= [1,0,-2,-1]
x=np.linalg.inv(A).dot(b)
print(x)
```

```
[ 0.17250495 -0.01068021 -0.38718375 -0.22092097]
```

In [44]:
```
#QUESTION 4
D=np.diagflat(np.diag(A))
J=np.linalg.inv(D).dot(D-A)
print(J)
C=np.linalg.inv(D).dot(b)
print(C)
```

```
[[ 0.         -0.00970605  0.01164725 -0.04762594]
 [-0.01092328  0.          0.07646294 -0.09419348]
 [ 0.01275046  0.07437766  0.          0.10994958]
 [-0.04949032 -0.08697349  0.10436819  0.        ]]
[ 0.16638935  0.         -0.36429872 -0.17290287]
```

In [45]:
```
#QUESTION 5
det=np.linalg.det(J)
if det!=0:
    print("J est inversible puisque det(J)=",det)
```

```
J est inversible puisque det(J)= -2.748813242563203e-06
```

In [56]:
```
#QUESTION 6
x0=[0,0,0,0]
for i in  np.arange(20):
    x0=J.dot(x0)+C
    if(i==15 or i==20):
        print(x0)
```

```
[ 0.17250495 -0.01068021 -0.38718375 -0.22092097]
```

In [ ]:
```

```