

S No	Matrix	Root															
1	$83x + 11y - 4z = 95$ $7x + 52y + 13z = 104$ $3x + 8y + 29z = 71$	X: [1.05792683] Y: [1.36716524] Z: [1.96168612]															
2	$8x - 3y + 2z = 45$ $4x + 11y - z = 71$ $6x + 3y + 12z = 35$	X: [7.40035273] Y: [3.61022928] Z: [-1.68606702]															
3	<table><tr><td>25</td><td>5</td><td>1</td><td>a1</td><td>106.8</td></tr><tr><td>64</td><td>8</td><td>1</td><td>a2</td><td>= 177.2</td></tr><tr><td>144</td><td>12</td><td>1</td><td>a3</td><td>279.2</td></tr></table>	25	5	1	a1	106.8	64	8	1	a2	= 177.2	144	12	1	a3	279.2	X: [0.29047619] Y: [19.69047619] Z: [1.08571429]
25	5	1	a1	106.8													
64	8	1	a2	= 177.2													
144	12	1	a3	279.2													

CODE:

```
from numpy import array ,arange ,zeros
from scipy.linalg import lu
A= array([[25,5,1],[64,8,1],[144,12,1]])
B=array([[106.8],[177.2],[279.2]])
n,n = A.shape
z=zeros([3,1])
L = zeros((n, n))
U = zeros((n, n))
for i in range(n):
    for j in range(i):
        suma = 0
        for k in range(j):
            suma += L[i][k] * U[k][j]
        L[i][j] = (A[i][j] - suma) / U[j][j]
    L[i][i] = 1
    for j in range(i, n):
        sumb = 0
        for k in range(i):
            sumb += L[i][k] * U[k][j]
        U[i][j] = A[i][j] - sumb
z=zeros([3,1])
for i in range(0,3):
    z[i,0]=B[i,0]
    for j in range (0,i):
        z[i,0]=(z[i,0]-L[i,j]*z[j,0])
Z = z[2]/U[2,2]
Y = (z[1]-(U[1,2]*Z)) / U[1,1]
X= (z[0]-U[0,1]*Y - U[0,2]*Z)/U[0,0]

print('L: ',L)
print('U: ',U)
print()
print('y1 = ',z[0])
print('y2 = ',z[1])
print('y3 = ',z[2])
print()
print('X: ',X)
print('Y: ',Y)
print('Z: ',Z)
```

OUTPUT:

```
L:  [[1.  0.  0. ]
     [2.56 1.  0. ]
     [5.76 3.5  1. ]]
U:  [[25.  5.  1. ]
     [ 0. -4.8 -1.56]
     [ 0.  0.  0.7 ]]

y1 =  [106.8]
y2 =  [-96.208]
y3 =  [0.76]

X:  [0.29047619]
Y:  [19.69047619]
Z:  [1.08571429]
```

