LU Decomposition

AIM:

To write a program to find the LU Decomposition of a matrix.

Equipments Required:

1. Hardware – PCs
2. Anaconda – Python 3.7 Installation / Moodle-Code Runner

Algorithm

Step 1:

Import numpy library using import statement.

Step 2:

From scipy package import lu().

Step 3:

Get input from user and pass it as an array.

Step 4:

Get P, L, U matrix using lu()

Step 5:

Print L and U matrix

Program:

```
#Program to find L and U matrix using LU decomposition.
#Developed by: Yogeshvar.M
#RegisterNumber: 22003358

import numpy as np
from scipy.linalg import lu
A = np.array(eval(input()))
P, L, U = lu(A)
```

```
print(L)
print(U)
```

Output:

	Input	Expected	Got	
✔	[[3, 2, 7], [2, 3, 1], [3, 4, 1]]	[[1. 0. 0.] [1. 1. 0.] [0.66666667 0.83333333 1.]] [[3. 2. 7.] [0. 2. -6.] [0. 0. 1.33333333]]	[[1. 0. 0.] [1. 1. 0.] [0.66666667 0.83333333 1.]] [[3. 2. 7.] [0. 2. -6.] [0. 0. 1.33333333]]	✔
✔	[[5, 1, 8], [4, 5, 7], [8, 9, 1]]	[[1. 0. 0.] [0.625 1. 0.] [0.5 -0.10810811 1.]] [[8. 9. 1.] [0. -4.625 7.375] [0. 0. 7.2972973]]	[[1. 0. 0.] [0.625 1. 0.] [0.5 -0.10810811 1.]] [[8. 9. 1.] [0. -4.625 7.375] [0. 0. 7.2972973]]	✔

Passed all tests! ✔

Result:

Thus the program to find the LU Decomposition of a matrix is written and verified using python programming.