1) Solve the following set of equations using an LU decomposition. Then move on the find the inverse of the coefficient matrix A.

3.0 x1 - 0.1x2 - 0.2 x3 = 7.85
0.1 x1 + 7.0 x2 -0.3 x3 = -19.3
0.3 x1 -0.2 x2 + 10.0 x3 =71.4

Solution:

Part-1:

```
 Input matrix A and b
    3.000000   -0.100000   -0.200000    7.850000
    0.100000    7.000000   -0.300000  -19.299999
    0.300000   -0.200000   10.000000   71.400002
 matrix U after elimination
    3.000000   -0.100000   -0.200000
    0.000000    7.003333   -0.293333
    0.000000    0.000000   10.012042
 matrix L and y after forward elimination
    1.000000    0.000000    0.000000    7.850000
    0.033333    1.000000    0.000000  -19.561666
    0.100000   -0.027130    1.000000   70.084295
 solution x
    3.000000   -2.500000    7.000000
```

Part-2:

```
  Input matrix A and b
    3.000000   -0.100000   -0.200000
    0.100000    7.000000   -0.300000
    0.300000   -0.200000   10.000000
 matrix U after elimination
    3.000000   -0.100000   -0.200000
    0.000000    7.003333   -0.293333
    0.000000    0.000000   10.012042
 matrix L after elimination
    1.000000    0.000000    0.000000
    0.033333    1.000000    0.000000
    0.100000   -0.027130    1.000000
 matrix inverse
    0.332489    0.004944    0.006798
   -0.005182    0.142903    0.004183
   -0.010078    0.002710    0.099880
```