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SE-Comps B/Batch C

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LA ISE-1

Program No.1 :- Find the 4th row, 2nd column, trace, rank and also display the lower and upper triangular matrix for the following matrix.

$$A = \begin{bmatrix} 45 & 26 & 21 & 47 \\ 475 & 41 & 23 & 63 \\ 61 & 800 & 93 & 75 \\ 24 & 55 & 66 & 10 \end{bmatrix}$$

Code :-

```
clc
A = [45, 26, 21, 47; 475, 41, 23, 63; 61, 800, 93, 75; 24, 55, 66, 10];
printf("A is :");
disp(A);
printf("4th Row : ");
disp(A(4, :));
printf("2nd Column : ");
disp(A(:, 2));
printf("Trace : ");
disp(trace(A));
printf("Rank : ");
disp(rank(A));
printf("Upper Triangular Matrix : ");
disp(triu(A));
printf("Lower Triangular Matrix : ");
disp(tril(A));
```

Output :-

```
Scilab 6.1.1 Console
A is :
  45.    26.    21.    47.
 475.    41.    23.    63.
  61.   800.    93.    75.
  24.    55.    66.    10.
4th Row :
  24.    55.    66.    10.
2nd Column :
  26.
  41.
 800.
  55.
Trace :
 189.
Rank :
  4.
Upper Triangular Matrix :
  45.    26.    21.    47.
  0.    41.    23.    63.
  0.     0.    93.    75.
  0.     0.     0.    10.
Lower Triangular Matrix :
  45.     0.     0.     0.
 475.    41.     0.     0.
  61.   800.    93.     0.
  24.    55.    66.    10.

--> |
```

Program No. 2:- Solve the given system of equations in terms of x,y,z,w using Gauss Elimination method

$$4x+y+z+w=2.4$$

$$x+5y+2z+w=0.7$$

$$2x-3y+3z+2w=3.5$$

$$3x+y+z-5w=2.7$$

Code:-

```
clc
A = [4, 1, 1, 1; 1, 5, 2, 1; 2, -3, 3, 2; 3, 1, -1, 5];
B = [2.4; 0.7; 3.5; 2.7];
C = [A B];
printf("C is : ");
disp(C);
n = 4;
for i=1 : n
    if C(i,i)~=0
        C(i, :) = C(i, :) / C(i, i);
        disp(C);
        for j=1 : n-1
            if i+j<n+1
                C(i+j, :) = C(i+j, :) - C(i+j, i)* C(i, :);
            else
                end
            end
        end
    end
end
disp(C);
w = C(4, 5);
z = C(3, 5) - w* C(3, 4);
y = C(2, 5) - w* C(2, 4) - z* C(2, 3);
x = C(1, 5) - w* C(1, 4) - z* C(1, 3) - y* C(1, 2);
printf("x = ");
disp(x);
printf("y = ");
disp(y);
printf("z = ");
disp(z);
printf("w = ");
disp(w);
```

Output :-

Scilab 6.1.1 Console

C is :

```
4.  1.  1.  1.  2.4
1.  5.  2.  1.  0.7
2. -3.  3.  2.  3.5
3.  1. -1.  5.  2.7
```

```
1.  0.25  0.25  0.25  0.6
1.  5.    2.    1.    0.7
2. -3.    3.    2.    3.5
3.  1.   -1.    5.    2.7
```

```
1.  0.25  0.25      0.25      0.6
0.  1.    0.3684211  0.1578947  0.0210526
0. -3.5   2.5       1.5       2.3
0.  0.25 -1.75     4.25      0.9
```

```
1.  0.25  0.25      0.25      0.6
0.  1.    0.3684211  0.1578947  0.0210526
0.  0.    1.        0.5416667  0.6263889
0.  0.   -1.8421053  4.2105263  0.8947368
```

```
1.  0.25  0.25      0.25      0.6
0.  1.    0.3684211  0.1578947  0.0210526
0.  0.    1.        0.5416667  0.6263889
0.  0.    0.        1.        0.3933333
```

```
1.  0.25  0.25      0.25      0.6
0.  1.    0.3684211  0.1578947  0.0210526
0.  0.    1.        0.5416667  0.6263889
0.  0.    0.        1.        0.3933333
```

x =

0.4466667

y =

-0.1933333

z =

0.4133333

w =

0.3933333