ESO 208 COMPUTER ASSIGNMENT-02

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ROLL NO: 200457

Gauss elimination (GE; without pivoting)

Enter the number in front of the method you want to use
1. Gauss Elimination(without pivoting)
2. Gauss Elimination(with pivoting)
3. GE (with scaling and pivoting)
4. LU decomposition by using GE (without pivoting)
5. LU decomposition by using GE (with pivoting)
6. LU decomposition by Crout's method (without pivoting)
7. Cholesky decomposition (for symmetric positive definite matrix
1

TEST CASE 1:

Input

3
4.0 2.0 0.0 10.0
2.0 4.0 1.0 11.5
0.0 1.0 5.0 4.5

Output

X:
1.5000
2.0000
0.5000

TEST CASE 2:

Input

3
4.0 2.0 0.0 10.0
2.0 4.0 1.0 11.5
0.0 1.0 5.0 5

Output:

X:
1.5179
1.9643
0.6071

GE (with pivoting)

Enter the number in front of the method you want to use
1. Gauss Elimination(without pivoting)
2. Gauss Elimination(with pivoting)
3. GE (with scaling and pivoting)
4. LU decomposition by using GE (without pivoting)
5. LU decomposition by using GE (with pivoting)
6. LU decomposition by Crout's method (without pivoting)
7. Cholesky decomposition (for symmetric positive definite matrix
2

TEST CASE 1

Input

3
4.0 2.0 0.0 10.0
2.0 4.0 1.0 11.5
0.0 1.0 5.0 4.5

Output

X:

1.5000
2.0000
0.5000

Permutation Matrix:

1.0000 0.5000 0 2.5000
0 1.0000 0.3333 2.1667
0 0 4.6667 2.3333

TEST CASE 2:

Input

3
4.0 2.0 0.0 10.0
2.0 4.0 1.0 11.5
0.0 1.0 5.0 5

Output

X:

1.5179
1.9643
0.6071

Permutation Matrix:

1.0000 0.5000 0 2.5000
0 1.0000 0.3333 2.1667
0 0 4.6667 2.8333

LU decomposition by using Crout method (without pivoting)

Enter the number in front of the method you want to use
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3. GE (with scaling and pivoting)
4. LU decomposition by using GE (without pivoting)
5. LU decomposition by using GE (with pivoting)
6. LU decomposition by Crout's method (without pivoting)
7. Cholesky decomposition (for symmetric positive definite matrix
6

TEST CASE 1:

Input File

3
4.0 2.0 0.0 10.0
2.0 4.0 1.0 11.5
0.0 1.0 5.0 4.5

Output File

L:

4.0000	0	0
2.0000	3.0000	0
0	1.0000	4.6667

U:

1.0000	0.5000	0
0	1.0000	0.3333
0	0	1.0000

X:

1.5000
2.0000
0.5000

TEST CASE 2

Input

3
4.0 2.0 0.0 10.0
2.0 4.0 1.0 11.5
0.0 1.0 5.0 5

Output

L:

```
   4.0000         0         0
   2.0000    3.0000         0
        0    1.0000    4.6667
```

U:

```
   1.0000    0.5000         0
        0    1.0000    0.3333
        0         0    1.0000
```

X:

```
   1.5179
   1.9643
   0.6071
```

Cholesky decomposition (for symmetric positive definite matrix)

Enter the number in front of the method you want to use
1. Gauss Elimination(without pivoting)
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4. LU decomposition by using GE (without pivoting)
5. LU decomposition by using GE (with pivoting)
6. LU decomposition by Crout's method (without pivoting)

7. Cholesky decomposition (for symmetric positive definite matrix
7

TEST CASE 1:

Input File

3
4.0 2.0 0.0 10.0
2.0 4.0 1.0 11.5
0.0 1.0 5.0 4.5

Output File

Cholesky factor LC :

2.0000	0	0
1.0000	1.7321	0
0	0.5774	2.1602

X:

1.5000
2.0000
0.5000