Programming Assignment – 2

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Ans 1

Input file for all methods:

input - Notepad

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```
   3
4 2 0 10
2 4 1 11.5
0 1 5 4.5
```

(a) Gauss Elimination without pivoting:

output - Notepad

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```
GAUSS ELIMINATION (WITHOUT PIVOTING)
X
1.500000
2.000000
0.500000
```

(b) Gauss Elimination with partial pivoting

output - Notepad

File Edit Format View Help

```
GAUSS ELIMINATION (WITH PARTIAL PIVOTING)
X
1.500000
2.000000
0.500000
```

(c) LU Decomposition Method by Doolittle Method

output - Notepad

File Edit Format View Help

```
DOLITTLE METHOD
X
1.500000
2.000000
0.500000
L
1.000000 0.000000 0.000000
0.500000 1.000000 0.000000
0.000000 0.333333 1.000000
U
4.000000 2.000000 0.000000
0.000000 3.000000 1.000000
0.000000 0.000000 4.666667
```

(d) LU Decomposition Method by Crout Method

output - Notepad

File Edit Format View Help

```
CROUT METHOD
X
1.500000
2.000000
0.500000
L
4.000000 0.000000 0.000000
2.000000 3.000000 0.000000
0.000000 1.000000 4.666667
U
1.000000 0.500000 0.000000
0.000000 1.000000 0.333333
0.000000 0.000000 1.000000
```

(e) LU Decomposition Method by Cholesky Method

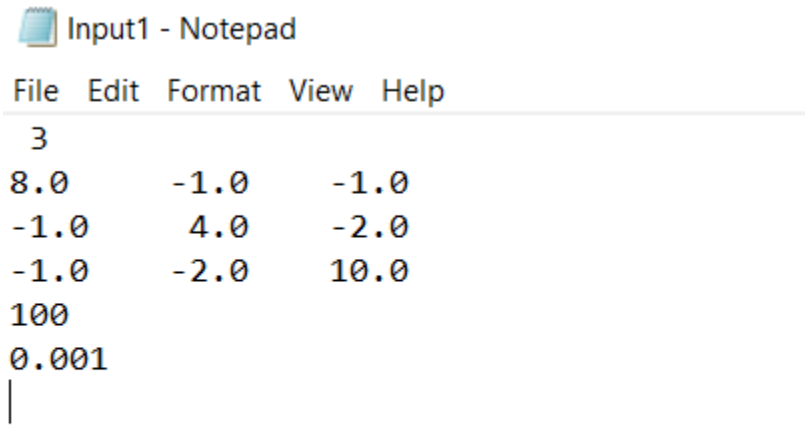
output - Notepad

File Edit Format View Help

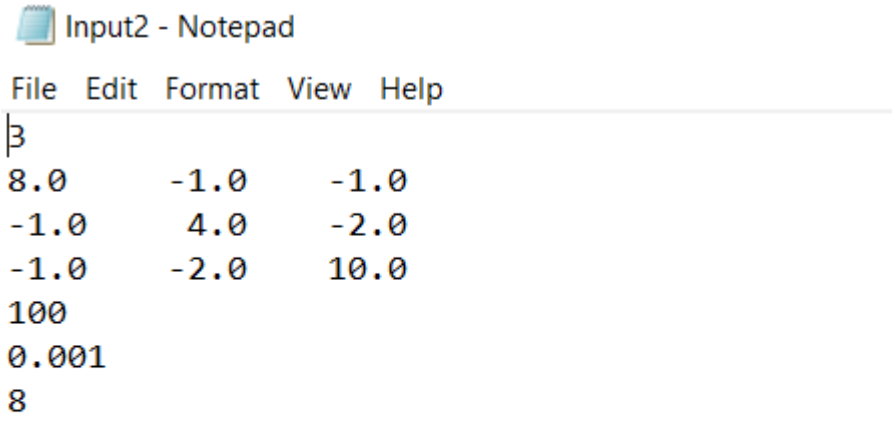
```
CHOLESKY METHOD
X
1.500000
2.000000
0.500000
L
2.000000 0.000000 0.000000
1.000000 1.732051 0.000000
0.000000 0.577350 2.160247
```

Ans 2

Input file for (a), (b), (d):



Input file for (c):



(a) Power Method

output1 - Notepad

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```
Eigenvalue
10.778672

Eigenvector
-0.267485
-0.255625
1.000000

Iterations
30

Eigenvalues obtained at each iteration
1 7.000000
2 8.857143
3 9.870968
4 10.297386
5 10.477944
6 10.568391
7 10.623473
8 10.661701
9 10.689930
10 10.711272
11 10.727521
12 10.739905
13 10.749333
14 10.756501
15 10.761944
16 10.766072
17 10.769201
18 10.771570
19 10.773364
20 10.774721
21 10.775747
22 10.776523
23 10.777110
24 10.777554
25 10.777890
26 10.778143
27 10.778335
28 10.778480
29 10.778589
30 10.778672
```

(b) Inverse Power Method

output2 - Notepad

File Edit Format View Help

```
Eigenvalue
3.074933

Eigenvector
0.269593
1.000000
0.327737

Iterations
12

Eigenvalues obtained at each iteration
1 2.500000
2 2.887701
3 3.010374
4 3.052061
5 3.066700
6 3.071940
7 3.073839
8 3.074534
9 3.074790
10 3.074885
11 3.074920
12 3.074933
```

(c) Inverse Power Method with Shift

output3 - Notepad

File Edit Format View Help

```
Eigenvalue
8.146131

Eigenvector
1.000000
-0.329774
0.183644

Iterations
6

Eigenvalues obtained at each iteration
1 8.200000
2 8.142857
3 8.146138
4 8.146126
5 8.146131
6 8.146131
```

(d) QR Method

output4 - Notepad

File Edit Format View Help

```
Eigenvalues
10.778928
8.150804
3.074941

Iterations
100
```