LAB #02
MATRICES

Spring 2023

CSE-301L Signals & Systems Lab

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Section: C

"On my honor, as a student of the University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work"

Submitted to:

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(15 Mar 2023)

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Task 1

Code:

```
```

Output:
```
>> T1
B =
    3    3    3
    1    3    4
    2    6   -1
>>
```

Task 2

Code:

```
```

Output:
```
>> T2

x3 =

 Columns 1 through 12


   0.4396   1.8930   1.6761   0.8197   1.1445   0.6940   0.9415
0.4311   0.2158   1.1082   1.0310   0.8345


 Columns 13 through 24


   1.5091   1.0803   0.6227   0.9830   1.1447   0.6280   0.7434
0.4147   1.3704   0.8927   1.0827   1.2959


 Columns 25 through 36
And so on…
```

Task 3

Code:

Output:

>> T3

A =

  Columns 1 through 20

 -120 -116 -112 -108 -104 -100 -96 -92 -88 -84 -80 -76
-72 -68 -64 -60 -56 -52 -48 -44

  Columns 21 through 40

  -40 -36 -32 -28 -24 -20 -16 -12   -8   -4   0   4   8
12   16   20   24   28   32   36

  Columns 41 through 60

   40   44   48   52   56   60   64   68   72   76   80   84   88
92   96 100 104 108 112 116

  Column 61
   120

Task 4

Code:

Output:

>> T4

C =

22	101	69	0
77	-13	102	21
103	70	45	14
61	34	26	75

D =

-46	-33	53	-18
53	169	78	3
-75	86	45	10
59	16	-20	-59

E =

5420	-4467	105	-283
11168	-3355	1732	2271
5429	-6412	1324	1722
2615	1793	964	1307

F =

5.6218	3.8795	-2.7906	-1.3273
7.8879	5.0640	-2.9492	-1.4727
4.0608	2.2202	-1.6864	-0.6143
0.3029	-0.0945	0.5704	0.0744

G =
 1.0e+102 *

| 0.0000 | 4.0653 | 0.0000 | -0.0000 |
| 0.0000 | 0.0000 | 0.0000 | 0.0000 |

```
    1.0125    0.0000    0.0000    0.0000
    0.0000    0.0000    0.0000    0.0000
```

H =
```
    0.5366    0.5291   -0.9661   -0.4121
    0.8268    0.5140    0.8940   -0.5366
    0.9906    0.5140    0.8509   -0.5366
   -0.3048   -0.1324    0.1411    0.9894
```

I =
```
   5.8310 + 0.0000i  8.1854 + 0.0000i  2.8284 + 0.0000i  3.0000 +
0.0000i
   3.4641 + 0.0000i  0.0000 + 9.5394i  3.4641 + 0.0000i  3.0000 +
0.0000i
   9.4340 + 0.0000i  0.0000 + 2.8284i  0.0000 + 0.0000i  1.4142 +
0.0000i
   1.0000 + 0.0000i  3.0000 + 0.0000i  4.7958 + 0.0000i  8.1854 +
0.0000i
```

J =
```
  -4.5649 + 0.0000i  3.1557 + 2.3145i  1.3740 + 0.0000i  -1.5427
+ 0.0000i
  14.4990 + 0.0000i  5.1582 + 7.4316i  1.5458 + 0.0000i   0.8947
+ 0.0000i
  15.0475 + 0.0000i  6.4988 + 7.3098i  2.0090 + 0.0000i   1.3251
+ 0.0000i
   0.0849 + 0.0000i  0.4731 - 0.8634i  3.4242 + 0.0000i   6.9863 +
0.0000i
```

Task 5

Code:

Output:

>> T5

B =

7	-4	12
9	10	2
11	8	11
5	4	1

C =

-5	9	10	2
6	11	8	11
15	5	4	1

D =

7	-4	12
9	10	2

Task 6

Code:

```
```

Output:

>> T6

ans =

-1	0	1

ans =

0	0	0

ans =

   0   1   1

ans =

  -1   0   0

Task 7

Code:

```
```

Output:

>> T7

col_sum =

   1   13

col_prod =

  -12   40

A_length =

   2

A_size =

   2   2

Task 8

Code:

```
```


Output:

>> T8

A =

```
  3   23   34   12   34    5    1
 12   34   34   32   23   23    2
 67   23    2    4    4    5    3
  4    5    1    1    2   34    4
 10   20   30   40   50   60    5
```

>>

Task 9

Code:

| |
| |
| |
| |
| |
| |
| |

Output:

\>> T9

ans =
    0.0838

ans =
   -0.2285
   -1.9479
   -0.4555
    0.4985
    0.8347
   -0.9657
   -1.3079
    1.3583
    0.0838

ans =
   -1.3079
    1.3583
    0.0838

Y =
 Columns 1 through 12

   20.0000   20.8081   21.6162   22.4242   23.2323   24.0404
   24.8485   25.6566   26.4646   27.2727   28.0808   28.8889

Columns 13 through 24

  29.6970 30.5051 31.3131 32.1212 32.9293 33.7374
34.5455 35.3535 36.1616 36.9697 37.7778 38.5859
So on…

Task 10

Code:

Output:

>> T10

x =
  -0.1111
   0.2222
   0.2222

Task 11

Code:

Output:
>> T11
Enter the matrix A: randn(3)
Enter the vector b: randn(3)

The solution is:
   0.9588 -4.0551   0.1070
   0.0514   0.4091 -0.4994
  -1.0130   1.8815   0.0637
>>