Lab1 - Nikola Uzelac MAT343

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MAT 343 MATLAB Assignment # 1

Question # 1

```
A = [1, 2; 3, 6]

B = [2, -3; 1, 4]

C = [-2, 1; 3, 2]


A =

     1      2
     3      6


B =

     2     -3
     1      4


C =

    -2      1
     3      2
```

Question #2

```
%(a)

A + B

B + A

% They are the same
```

```
ans =

       3    -1
       4    10


ans =

       3    -1
       4    10


%(b)

(A+B)+C

A+(B+C)

% Matrix Addition follows the associative property so they are the
  same

ans =

       1     0
       7    12


ans =

       1     0
       7    12


%(c)

x = 6

x*(A+B)

x*A + x*B

% Yes, they are the same

x =

       6


ans =

      18    -6
      24    60
```

```
ans =

    18    -6
    24    60
```

```
%(d)
```

```
A*(B+C)
```

```
A*B + A*C
```

```
% Multiplication is distributive in this case so it is the same
```

```
ans =

     8    10
    24    30
```

```
ans =

     8    10
    24    30
```

(e)

```
% (i)
A*B
```

```
A*C
```

```
ans =

     4     5
    12    15
```

```
ans =

     4     5
    12    15
```

(ii)

```
A*B
```

```
B*A
```

```
ans =


     4     5
    12    15



ans =


    -7   -14
    13    26



% (f)

% (i)
A * B

[A*B(:,1), A*B(:,2)]

% (ii)
A*B

[A(1,:)*B; A(2,:)*B]

% (iii)
% Matrix (i) is computed by first calling the first column of matrix B
 and multiplying it by Matrix A
   % then for the bottom row we call the second column of matrix B and
 multiply it by matrix A

% Matrix (ii) is computed by calling the first row of Matrix A and
 then multiplying it by matrix B
   % then for the bottom row the second row of matrix A is then
 multiplied by matrix B


ans =


     4     5
    12    15



ans =


     4     5
    12    15



ans =


     4     5
    12    15
```

```
ans =

     4     5
    12    15
```

Question 3

```
M = [eye(3) * 2]

N = [zeros(2,2)]

P = ones(3,3)*3, triu(P,0)

Q = [ones(2,3) * 4]


M =

     2     0     0
     0     2     0
     0     0     2


N =

     0     0
     0     0


P =

     3     3     3
     3     3     3
     3     3     3


ans =

     3     3     3
     0     3     3
     0     0     3


Q =

     4     4     4
     4     4     4
```

Question 4

```
G = [A, eye(2, 2), N; N, B, eye(2, 2); eye(2, 2), N, C]
```

```
G =

     1     2     1     0     0     0
     3     6     0     1     0     0
     0     0     2    -3     1     0
     0     0     1     4     0     1
     1     0     0     0    -2     1
     0     1     0     0     3     2
```

Question 5

```
%(a)

H = G(1:3, 1:3)

%(b)

E = H

E(3:3, 3:3) = 5

E

%(c)

H(2, :) = []

F = H

F

%(d)

% G(:,:) - Since it called all the columns and all the rows nothing
 visibly
% changed

% G(:) - Every value is return and placed into a single column vector
% (36x1) Matrix

%(e)

 G(8)

% The value 6 was returned which was the 8th iteration when you
 traverse
% each element row by row.

%(f)

% When G(10,1) was executed an msg stating 'Index exceeds matrix
```

```
% dimensions' popped up. This was most likely due to G not having 10
 rows.

% (g)

% When G(G>2) is executed it returns all numbers greater than 2 in the
% matrix

% When G(G>2) = 50 is exectued it replaces all numbers in the matrix
 which
% are greater than 2 with 50.
```

H =

1	*2*	*1*
3	*6*	*0*
0	*0*	*2*

E =

1	*2*	*1*
3	*6*	*0*
0	*0*	*2*

E =

1	*2*	*1*
3	*6*	*0*
0	*0*	*5*

E =

1	*2*	*1*
3	*6*	*0*
0	*0*	*5*

H =

1	*2*	*1*
0	*0*	*2*

F =

1	*2*	*1*
0	*0*	*2*

F =

```
        1       2       1
        0       0       2


ans =

        6
```
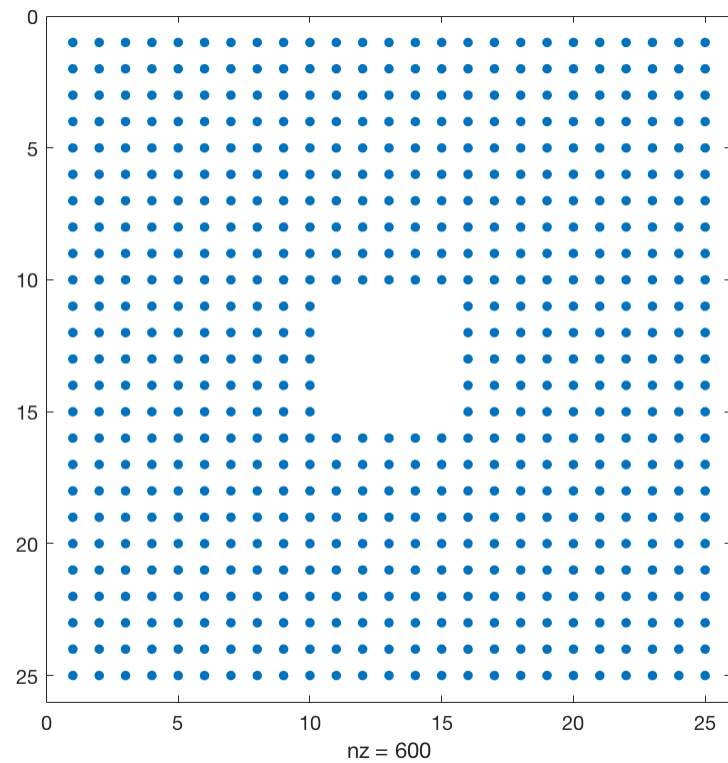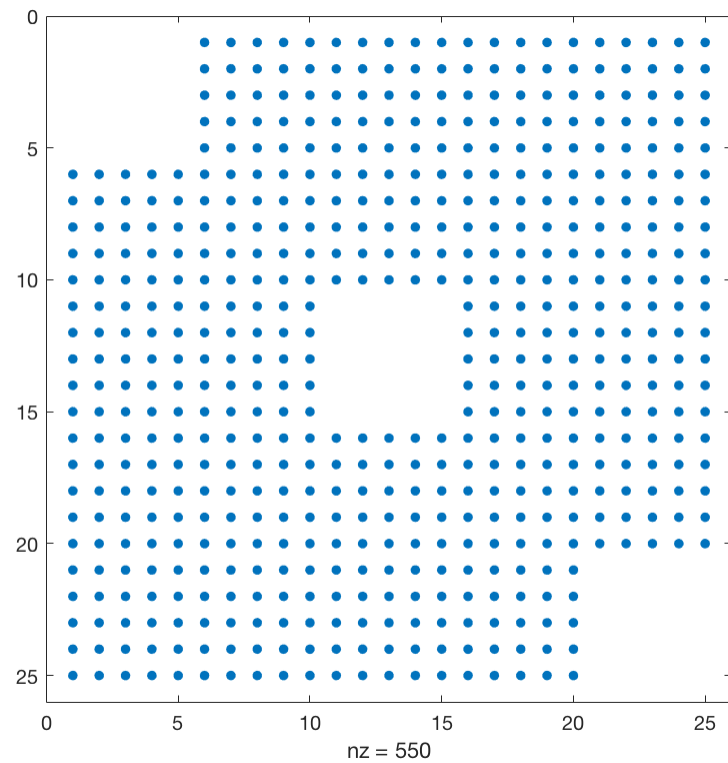
Question 6

```
A = ones(25);

A(11:15,11:15) = 0;

figure(1)
spy(A)

A(1:5, 1:5) = 0;
A(21:25, 21:25) = 0;

figure(2)
spy(A)
```

nz = 550

Question 7

```
A = diag(1:6) + diag(7:11, 1) + diag(12:15, 2)

A = A + triu(A, 1)'


A =

     1     7    12     0     0     0
     0     2     8    13     0     0
     0     0     3     9    14     0
     0     0     0     4    10    15
     0     0     0     0     5    11
     0     0     0     0     0     6


A =

     1     7    12     0     0     0
     7     2     8    13     0     0
    12     8     3     9    14     0
     0    13     9     4    10    15
     0     0    14    10     5    11
     0     0     0    15    11     6
```

Question 8

```
% (a)

A = [1, 2, 3; 4, 5, 6; 7, 8, 9]

A(2,:) = A(2,:)-4*A(1,:)

% The way this row operation works is it takes the elements in the
 second
% row and subract 4 * (number in the row above them). For Example:
% 4 - 4(1), 5 - 4(2), 6 - 4(3).

% (b)
A(3,:) = A(3,:)-7*A(1,:)

% (c)
A(2,:) = A(2,:)/-3


A =

     1     2     3
     4     5     6
     7     8     9


A =

     1     2     3
     0    -3    -6
     7     8     9


A =

     1     2     3
     0    -3    -6
     0    -6   -12


A =

     1     2     3
     0     1     2
     0    -6   -12
```

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