

```
% ASSIGNMENT 1
% Akash Rout (21103080)
```

```
% Question 1
```

```
% Part A
```

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

```
arr = 3x3
     1     2     3
     4     5     6
     7     8     9
```

```
% Part B
```

```
r1=2:10;
r2=4:2:20;
arr2=[r1; r2];
arr2
```

```
arr2 = 2x9
     2     3     4     5     6     7     8     9    10
     4     6     8    10    12    14    16    18    20
```

```
% Question 2
```

```
% Part A
```

```
sin(arr)+arr
```

```
ans = 3x3
     1.8415     2.9093     3.1411
     3.2432     4.0411     5.7206
     7.6570     8.9894     9.4121
```

```
% Part B
```

```
arr'+arr
```

```
ans = 3x3
     2     6    10
     6    10    14
    10    14    18
```

```
% Question 3
```

```
array1 = [1, 2, 3; 4, 5, 6; 7, 8, 9];
array2 = [9, 8, 7; 6, 5, 4; 3, 2, 1];
```

```
% Part A
```

```
resultArray = array1 .* array2;
```

```
resultArray
```

```
resultArray = 3x3
    9    16    21
   24    25    24
   21    16     9
```

```
% Part B
```

```
resultArray = array1 ./ array2;
resultArray
```

```
resultArray = 3x3
    0.1111    0.2500    0.4286
    0.6667    1.0000    1.5000
    2.3333    4.0000    9.0000
```

```
% Part C
```

```
resultArray = array1 .^ array2;
resultArray
```

```
resultArray = 3x3
         1        256       2187
       4096       3125      1296
        343         64         9
```

```
% Part D
```

```
% (i)
```

```
vertcat(array1, array2)
```

```
ans = 6x3
     1     2     3
     4     5     6
     7     8     9
     9     8     7
     6     5     4
     3     2     1
```

```
horzcat(array1, array2)
```

```
ans = 3x6
     1     2     3     9     8     7
     4     5     6     6     5     4
     7     8     9     3     2     1
```

```
% Part E
```

```
array1*array2
```

```
ans = 3x3
    30    24    18
    84    69    54
   138   114    90
```

```
% Question 4
```

```
% Part A
inv(arr)
```

```
Warning: Matrix is close to singular or badly scaled. Results may be inaccurate. RCOND =
1.541976e-18.
```

```
ans = 3x3
1016 ×
   -0.4504    0.9007   -0.4504
    0.9007   -1.8014    0.9007
   -0.4504    0.9007   -0.4504
```

```
% Part B
det(arr)
```

```
ans = 6.6613e-16
```

```
% Part C
rank(arr)
```

```
ans = 2
```

```
% Part D
size(arr)
```

```
ans = 1x2
      3      3
```

```
% Question 5
```

```
% Part A
zeros(3, 5)
```

```
ans = 3x5
      0      0      0      0      0
      0      0      0      0      0
      0      0      0      0      0
```

```
% Part B
ones(4, 7)
```

```
ans = 4x7
      1      1      1      1      1      1      1
      1      1      1      1      1      1      1
      1      1      1      1      1      1      1
      1      1      1      1      1      1      1
```

```
% Part C
eye(5)
```

```
ans = 5x5
    1     0     0     0     0
    0     1     0     0     0
    0     0     1     0     0
    0     0     0     1     0
    0     0     0     0     1
```

```
% Part D
e1=[3, 5, 7]
```

```
e1 = 1x3
     3     5     7
```

```
diag(e1)
```

```
ans = 3x3
     3     0     0
     0     5     0
     0     0     7
```

```
% Part E
rand(3, 5)
```

```
ans = 3x5
    0.7094    0.6797    0.1190    0.3404    0.7513
    0.7547    0.6551    0.4984    0.5853    0.2551
    0.2760    0.1626    0.9597    0.2238    0.5060
```

```
% Part F
10+(100-10)*rand(4, 6)
```

```
ans = 4x6
    72.9169    22.4762    32.8854    41.4985    52.5960    59.4751
    90.1813    23.4365    83.2856    27.6936    41.6494    92.5474
    96.3362    33.1757    31.9172    32.5975    84.7746    35.7255
    59.2494    85.6646    93.6337    65.4440    62.6738    78.1480
```

```
% Part G
magic(4)
```

```
ans = 4x4
    16     2     3    13
     5    11    10     8
     9     7     6    12
     4    14    15     1
```

```
% Question 6
```

```
rows = input("Enter the number of rows: ")
```

```
rows = 3
```

```
cols = input("Enter the number of columns: ")
```

```
cols = 3
```

```
user_array = zeros(rows, cols);  
for i = 1:rows  
    for j = 1:cols  
        num = input("Enter element: ")  
        user_array(i, j) = num;  
    end  
end
```

```
num = 5  
num = 7  
num = 6  
num = 8  
num = 5  
num = 5  
num = 2  
num = 4  
num = 6
```

```
user_array
```

```
user_array = 3x3  
    5    7    6  
    8    5    5  
    2    4    6
```

```
% Question 7
```

```
real=[1 5 8; 6 5 8; 7 1 3];  
img=[2 2 4; 1 3 6; 5 8 1];  
complex(real, img)
```

```
ans = 3x3 complex  
    1.0000 + 2.0000i    5.0000 + 2.0000i    8.0000 + 4.0000i  
    6.0000 + 1.0000i    5.0000 + 3.0000i    8.0000 + 6.0000i  
    7.0000 + 5.0000i    1.0000 + 8.0000i    3.0000 + 1.0000i
```

```
% Question 8
```

```
cell_array = {1, 'hello', [2, 3; 4, 5]; pi, 'world', [6, 7, 8]}
```

```
cell_array = 2x3 cell
```

	1	2	3
1	1	'hello'	[2,3;4,5]
2	3.1416	'world'	[6,7,8]

% Question 9

```
student1.id = 21103080;  
student1.name = 'Akash';  
student1.age = 20;  
student1
```

```
student1 = struct with fields:  
    id: 21103080  
    name: 'Akash'  
    age: 20
```

% Question 10

```
original_array = reshape(1:28, 4, 7)
```

```
original_array = 4x7  
    1     5     9    13    17    21    25  
    2     6    10    14    18    22    26  
    3     7    11    15    19    23    27  
    4     8    12    16    20    24    28
```

```
subarray = original_array(2:3, 2:4)
```

```
subarray = 2x3  
     6    10    14  
     7    11    15
```