Lecture (6)

* Inverse matrix ; Using the Command (inv)

e.g >> A = [1 4 ; -2 5] ; ↵
>> B = inv(A) ↵

or >> B = A^(-1)

* Matrix determinant ; Using the Command (det)

e.g
>> A = [1 4 ; -2 5] ; ↵
>> C = det(A) ↵

* Matrix rank ; Using the Command (rank)

for example

>> A = [1 4 ; -2 5] ; ↵

>> D = rank(A) ↵

h.w ① If you have $A = \begin{bmatrix} 1 & 5 & 6 \\ -7 & 3 & 0 \\ 4 & 1 & 2 \end{bmatrix}$

Find ① The inverse of Matrix (A)
② Determinant of matrix (A)
③ The rank of matrix (A)

* Matrix reshape :

1- Matrix recycling :

(A) the Command of trasposе

e.g: A' , B' , C' ----

(B) fliplr : (left - to - right) transpose the matrix around a vertical axis

e.g

$$A = \begin{bmatrix} 9 & 4 & 4 \\ 2 & 8 & 0 \\ 6 & 7 & 8 \end{bmatrix}$$

Find transpose the matrix around a vertical axis

Application :

```
>> A = [9 4 4 ; 2 8 0 ; 6 7 8] ↵
>> fliplr(A) ↵

ans =
     4     4     9
     0     8     2
     8     7     6
```

$C_1 \Leftrightarrow C_3$

(c) flipud : (up-to-down) transpose the matrix around a horizontal axis.

e.g $A = \begin{bmatrix} 9 & 4 & 4 \\ 2 & 8 & 0 \\ 6 & 7 & 8 \end{bmatrix}$

```
>> A = [9 4 4 ; 2 8 0 ; 6 7 8] ;↵
>> flipud(A) ↵
ans =
```

$$\begin{matrix} 6 & 7 & 8 \\ 2 & 8 & 0 \\ 9 & 4 & 4 \end{matrix} \quad R_1 \Leftrightarrow R_3$$

(d) Rearranging the columns of the matrix :

اذا تم ترتيب اعمدة المصفوفة

e.g

$$A = \begin{bmatrix} 9 & 4 & 4 \\ 2 & 8 & 0 \\ 6 & 7 & 8 \end{bmatrix}$$

find replacing the column (2) by (3)

sol>

```
>> A = [9 4 4 ; 2 8 0 ; 6 7 8] ;↵
>> B = A( : , [1 3 2]) ↵
```

all elements of the row ↓ C_1 ↓ C_3 replace C_2 ↘ C_2 replace C_3

```
B =
```

$$\begin{matrix} 9 & 4 & 4 \\ 2 & 0 & 8 \\ 6 & 8 & 7 \end{matrix}$$

(e) Rearranging the rows of the matrix:

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e.g

$$A = \begin{bmatrix} 9 & 4 & 4 \\ 2 & 8 & 0 \\ 6 & 7 & 8 \end{bmatrix}$$

Find replacing the row (1) by (2)

```
>> A = [9 4 4 ; 2 8 0 ; 6 7 8] ↵
>> C = A([2 1 3], :) ↵
```

R2 replace R1 ↓ R1 replace R2 ↓ R3 ↓ : all elements of the column

C:

```
2  8  0
9  4  4
6  7  8
```