# LEC – 8

## d=min(a,b)

يعطي مصفوفة

➢ Example:  $if \quad a = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{matrix}$   and   $b = \begin{matrix} 1 & 2 & -3 \\ 4 & 5 & 6 \\ 0 & 8 & -19 \end{matrix}$

➕ *Find  min(a, b)*

Solution:         $d = \begin{matrix} 1 & 2 & -3 \\ 4 & 5 & 6 \\ 0 & 8 & -19 \end{matrix}$

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## d=max(a,b)

➢ Example:  $if \quad a = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{matrix}$    and   $b = \begin{matrix} 1 & 2 & -3 \\ 4 & 5 & 6 \\ 0 & 8 & -19 \end{matrix}$

➢ *Find  max(a, b)*

Solution:         $d = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{matrix}$

➢ If       $a = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{matrix}$        and        $b = \begin{matrix} 1 & -8 & 2 \\ -9 & 4 & 3 \\ -1 & -5 & 3 \end{matrix}$

➢ complex(a,b)

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➤ $c = $ 1.0000 + 1.0000i   2.0000 − 8.0000i   3.0000 + 2.0000i
4.0000 − 9.0000i   5.0000 + 4.0000i   6.0000 + 3.0000i
7.0000 − 1.0000i   8.0000 − 5.0000i   9.0000 + 3.0000i

➤ $d = max(c)$

$d = $ 4.0000 − 9.0000i   8.0000 − 5.0000i   9.0000 + 3.0000i

➤ $d = min(c)$

$d = $ 1.0000 + 1.0000i    5.0000 + 4.0000i   3.0000 + 2.0000i

➤ $g = cumsum(c)$

$$g = \begin{matrix} 1+i & 2-8i & 3+2i \\ 5-8i & 7-4i & 9+5i \\ 12-9i & 15-9i & 18+8i \end{matrix}$$

➤ isequal(a,b): It is used to determine whether the two matrices (a,b) are   equal, where the number (zero) indicates that they are not equal and the number (one) indicates that they are equal.

➤ Example          $if \quad a = \begin{matrix} 2 & 4 \\ 7 & 5 \end{matrix} \quad and \quad b = \begin{matrix} 1 & 2 \\ 3 & 4 \end{matrix}$

Determine whether the two matrices (a and b) are equal?

➤ Solution:  $f = isequal(a, b) \implies f = 0$
➤ Power(a,x): It is used to create a matrix of the same size as the matrix (a) and its elements are values (a) raised to the power (x).

➢ Example:

$$if \quad a = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{matrix}$$

Find a matrix whose elements are raised to the power of (2)

✦ Solution:          $P = power(a, 2)$

$$p = \begin{matrix} 1 & 4 & 9 \\ 16 & 25 & 36 \\ 49 & 64 & 81 \end{matrix}$$

NOW:

Power(x,a): Find a matrix such that the elements of the new matrix are each element of the old matrix, which is an exponent of the powers to which it is required to be raised.

إيجاد مصفوفة بحيث عناصر المصفوفة الجديدة تكون كل عنصر من المصفوفة القديمة يكون اس للقوى المطلوب الرفع اليها.

✦ *Example*:

$$if \quad a = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{matrix} \qquad find \qquad power(2, a)$$

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- Solution                    $p = power(2, a)$

$$p = \begin{matrix} 2 & 4 & 8 \\ 16 & 32 & 64 \\ 128 & 256 & 512 \end{matrix}$$

- Power(a,b): Raise the first element of the first row of the first array with the first element of the first row of the second array.

- Example:  $if \quad a = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{matrix}$   and  $b = \begin{matrix} 1 & -8 & 2 \\ -9 & 4 & 3 \\ -1 & -5 & 3 \end{matrix}$

  *Find the powers between the two matrices $(a, b)$*

- *Solution:*   $y = power(a, b)$

- $y = \begin{matrix} 1.0000 & 0.0039 & 9.0000 \\ 0.0000 & 625.0000 & 216.0000 \\ 0.1429 & 0.0000 & 729.0000 \end{matrix}$

- isprime(a): It is used to check whether the sine of the matrix (a) is prime numbers or not.

- Example:  $if \quad a = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{matrix}$   Find the prime numbers of matrix (a).

- Solution:  $i = isprime(a)$

➕ $i = \begin{matrix} 0 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{matrix}$

➕ Constructing a matrix by iterating a partial matrix: The kron(a,b) command is used to create a large matrix consisting of the elements of matrix (a) multiplied by matrix (b).

بناء مصفوفة بتكرار مصفوفة جزئية: يستخدم الأمر (kron(a,b لإنشاء مصفوفة كبيرة تتكون من عناصر المصفوفة (a) مضروبة بالمصفوفة (b).

➕ Example:

$$if \quad a = \begin{matrix} 1 & 0 \\ 0 & 1 \end{matrix} \qquad b = \begin{matrix} 3 & 3 \\ 3 & 3 \end{matrix}$$

Find the largest matrix from the two matrices (a,b) and (b,a)

➕ Solution:

➕ $w_1 = kron(a, b) \implies w_1 = \begin{matrix} 3 & 3 & 0 & 0 \\ 3 & 3 & 0 & 0 \\ 0 & 0 & 3 & 3 \\ 0 & 0 & 3 & 3 \end{matrix}$

➕ $w_2 = kron(b, a) \implies w_2 = \begin{matrix} 3 & 0 & 3 & 0 \\ 0 & 3 & 0 & 3 \\ 3 & 0 & 3 & 0 \\ 0 & 3 & 0 & 3 \end{matrix}$