MONASH University

MONASH
ENGINEERING
ENG1060

MATRIX ADDRESSING

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GROUP OF EIGHT AUSTRALIA

MATRIX ADDRESSING: VECTORS

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- All values in a vector or matrix are assigned an address
  - Refer to numbers within a vector or a matrix to perform calculations
  - Create smaller matrices from a larger matrix

- To address elements in a vector

  Syntax: A(index)

- Example: A = [5 10 15 20 25 30 35 40]

  A(1) → 5 (first element)

  A(4) → 20 (fourth element)

  A(end) → 40 (last element)

MATRIX ADDRESSING: VECTORS

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- So we can use a scalar index to address an element vector

- What if we want multiple values from a vector?

  A = [10, 20, 30, 40, 50, 60]

  Individually… A(1) = 10, A(4) = 40, A(5) = 50 and A(6) = 60

- Alternatively, we can use an index that is a vector

  A([1 4 5 6]) = [10, 40, 50, 60]

  any other ways?

MATRIX ADDRESSING: 2D MATRICES

- Remember that
  - Square brackets [ ] are used to create matrices
  - Round brackets ( ) are used to address matrices

- Example:

  A = [6, 9, 15, 20, 98, 241, 259]

  A([1, 3:5, 7]) = [6, 15, 20, 98, 259]

- If elements of a vector have an index (or an address), do elements of other multi-dimensional matrices have an index?

MATRIX ADDRESSING: 2D MATRICES

- A 2D matrix has rows and columns
  - Therefore we give an index to the element's row and column

- MATLAB takes in the row argument first, then the column

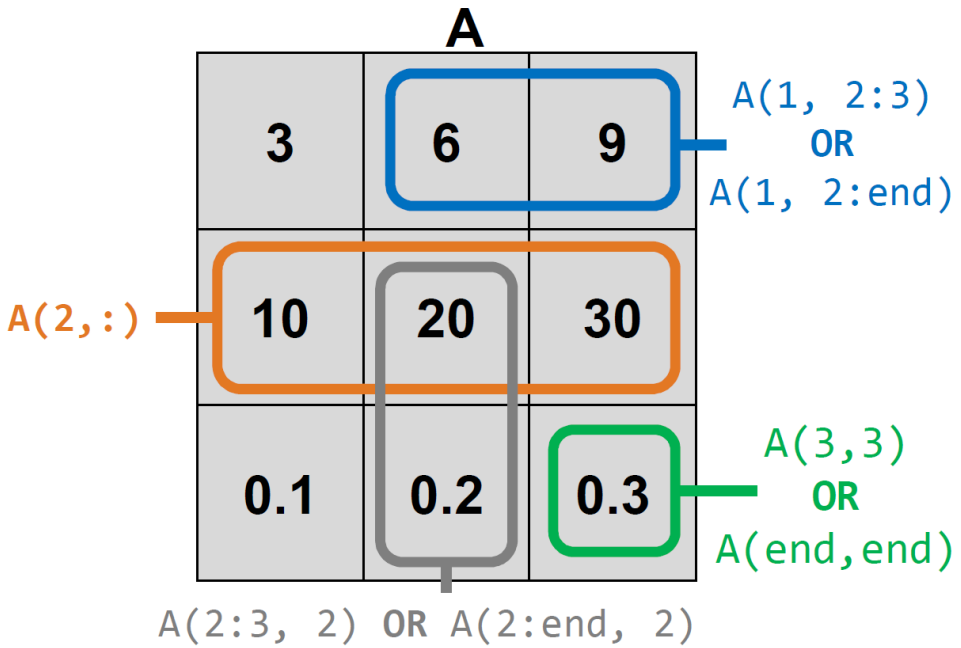
  Syntax: A(row_index, column_index)

- Again, vectors can be used as indices

- A colon (:) by itself tells MATLAB to return either all rows or all columns

MATRIX ADDRESSING: 2D MATRICES


```
A = [3:3:9 ; 10 20 30 ; 0.1, 0.2, 0.3];
```



SUMMARY

- Single element addressing of vectors and matrices
- Multiple element addressing of vectors and matrices
- The colon operator used as an index can address entire rows and columns

- If A(end) provides the last element, then what is the result of A(first)?