

Matrix Index

Quiz

Q6

$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

- $m = [1\ 2; 3\ 4];$ ~~$m(3)$~~
- A: 2
- B: 3
- C: error

~~3rd row~~
index of bound error
MATLAB

Matrix Index Too

Quiz

Q7

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

```
m = [1 2 3; 4 5 6; 7 8 9]; m(7)
```

- A: 3
- B: 7
- C: ~~error~~

~~m(7)~~
m(3, 1)

Ones Vector

Quiz

Q8

- sum(ones(2))
- A : 2
- B : 4
- C : something else

[1, 1]

2

[2, 2]

Zeros Vector

Quiz

- $sum(sum(ones(2)))$
 $(2, 2)$
- A : 2
- B : 4
- C : something else

Not!

Quiz

- $1 \neq 1$
- A : 0
- B : 1
- C : error

$$1 \approx = 1$$

↑

Replicate Randomness

Quiz

Q 9

- `f = @(x)(x + rand)`
- `f(1) == f(1)`
- A: 0
- B: 1
- C: error

`→ false`
`→ true`

(0.1)

Stored code.

`1 + rand`

`1 + rand`

Replicate Randomness Too

Quiz

- `rng(1); f = @(x)(x + rand); f(1) == f(1)`
 - A : 0
 - B : 1
 - C : error
- Handwritten annotations:* A blue box around `rng(1);` with an arrow pointing to the word "seed" above it. A blue circle around "A : 0" with an arrow pointing to the `rand` function in the code line above. The code line is underlined in blue.

Hermitian Transpose

Quiz

! → real type transpose.

$$\begin{bmatrix} 0 & i \\ 0 & 0 \end{bmatrix}^T \rightarrow \begin{bmatrix} 0 & 0 \\ i & 0 \end{bmatrix}$$

↓ Q10

$$\begin{bmatrix} 0 & 0 \\ i & 0 \end{bmatrix}$$

- $m = [0 \ i; 0 \ 0]'$; $m(2, 1)$
- $A: i$???
- $B: -i$
- $C: 0$

Floating Point

Quiz

- $0.1 + 0.1 + 0.1 - 0.3$

- A : 0

- B : 0.0000

- C : something else

$$5.55 \cdot 10^{-17}$$

Floating Point Too

Quiz

- $0.1 * 3 - 0.3$
- A : 0
- B : 0.0000
- C : something else

Singular Matrix Inversion

Quiz

$$\frac{\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}}{\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}}$$

Q11

$$\begin{bmatrix} \underline{\text{NaN}} & \text{Inf} \\ \underline{\text{NaN}} & \text{Inf} \end{bmatrix} ?$$

- `m = ones(2) / zeros(2); m(2, 2)`
- `A : NaN`
- `B : Inf`
- `C : error`

dec
condition # K

Singular Matrix Inversion Too

Quiz

$$\begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$$

$$\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

• `m = ones(2) \ zeros(2); m(2, 2)`

• **A : NaN**

• B : Inf

• C : error

$$\begin{pmatrix} NaN & NaN \\ NaN & NaN \end{pmatrix}$$

Diff Operator

Quiz

Q12

[1 1] not [1, 1, 1]

- $m = \text{diff}([1\ 2\ 3]) + [1\ 2\ 3]; m(1)$
- A: 1
- B: 2
- C: error

Colon Operator

Quiz

Q13

[1,2,3] [1,2,3]

1 + 1 : 3

• $m = \text{diff}(1:3) + 1:3; m(1)$

• A: 1 [1,1]

• B: 2

• C: error

[2,3]

$\text{diff}(1:3) + (1:3)$

Imaginary Stuff

Quiz

- ~~$i == j$~~
- $A : 0$
- $B : 1$
- $C : \text{something else}$

Assign I

Quiz

- `i = 3; 1 * i + 1`
- `A: 1 + i`
- `B: 4`
- `C: something else`

Assign I Again

Quiz

- `i = 3; 1i + 1`
- `A : 1 + i`
- `B : 4`
- `C : something else`

$\sqrt{-1}$

MATLAB

don't use `i, j`.
↓
`for`.

Length of Matrix

Quiz

2/4

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

- `length([1 2; 3 4])`
- `A : 2`
- `B : 4`
- `C : something else`

Length of Matrix Again

Quiz

MATLAB

NOT # rows

Q15

• `length([1 2; 3 4; 5 6])`

$\begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$

• A: 2

• B: 3

• C: something else

length $\left(\begin{bmatrix} 1 & 3 & 5 \\ 2 & 4 & 6 \end{bmatrix}\right)$

max(size)

Double Comparison Quiz

- $x = 2; 1 < x < 3$
- A : 0
- B : 1
- C : error

Double Comparison Too

Quiz

- `x = 4; 1 < x < 3`
- A: 0
- B: 1
- ~~C: error~~



don't do this!

false.

Q16

if `1 < x < 3`
then

Double Comparison Three

Quiz

1 < 0 < 3

Q17

• $x = 0; 1 < x < 3$

• A : 0

• B : 1

• C : error

Not a Number

Quiz

in MATLAB



- max(1, 0/0) *ignore NaN*
- A : 0
- B : 1
- C : something else
 _____ *NaN*

Infinity

Quiz

- $\text{max}(1, \underline{1/0})$ ^{Inf}
- A: 0
- B: 1
- C: ~~something else~~ ^{Inf}

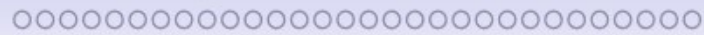
All Quiz

in MATLAB % ignored.

- $\text{all}([1, 0/0]) = 1$
- A : 0
- B : 1
- C : something else

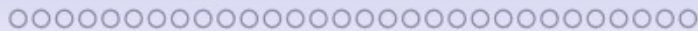
ad: $\frac{CS540}{\text{in Summer}}$

[MATLAB
Python
Java]



Data and Plots

Code



Apps

Code

Blank Slide