>> #Ricardo Lucas Fernández

>>

>> #45135839H (abajo)

>>

>> A = [4 5 1; 3 5 8; 3 9 0; 1 0 1]

A =

4 5 1

3 5 8

3 9 0

1 0 1

>> I = [ 1 0 0; 0 1 0; 0 0 1]

I =

1 0 0

0 1 0

0 0 1

>> AI = [A I]

error: horizontal dimensions mismatch (4x3 vs 3x3)

>> I = [ 1 0 0; 0 1 0 ; 1 0; 0 0 1 ]

error: vertical dimensions mismatch (2x3 vs 1x2)

>> I = [ 1 0 0; 0 1 0 ; 0 0 1 ]

I =

1 0 0

0 1 0

0 0 1

>> AI = [A I]

error: horizontal dimensions mismatch (4x3 vs 3x3)

>> I = [ 1 0 0; 0 1 0 ; 0 0 1 ; 0 0 0]

I =

1 0 0

0 1 0

0 0 1

0 0 0

>> AI = [A I]

AI =

4 5 1 1 0 0

3 5 8 0 1 0

3 9 0 0 0 1

1 0 1 0 0 0

>> rref(A)

ans =

1 0 0

0 1 0

0 0 1

0 0 0

>> rref(AI)

ans =

1 0 0 0 -3/20 1/12

0 1 0 0 1/20 1/12

0 0 1 0 3/20 -1/12

0 0 0 1 1/5 -2/3

>> #Por lo tanto nos queda la matriz canonica a la izq (3 primeras columnas) y a la dech la de paso

>> #AC = E \* A

>> E \* A

Ejercicio 2

>> #a)

>>

>> A = [4 4 4;]

A =

4 4 4

>> A = [4 4 4; 5 5 -5; 1 0 1; 3 0 3]

A =

4 4 4

5 5 -5

1 0 1

3 0 3

>> b = [24; 0; 4; 9]

b =

24

0

4

9

>> rank(A)

ans = 3

>> Ab = [A b]

Ab =

4 4 4 24

5 5 -5 0

1 0 1 4

3 0 3 9

>> rank(Ab)

ans = 4

>> #Sistema Incompatible

b)

A = [5 5 5 -15 10; 8 16 -16 -40 -16; 9 -3 -9 -3 12]

A =

5 5 5 -15 10

8 16 -16 -40 -16

9 -3 -9 -3 12

>> b = [20; -24; 12]

b =

20

-24

12

>> Ab = [A b]

Ab =

5 5 5 -15 10 20

8 16 -16 -40 -16 -24

9 -3 -9 -3 12 12

>> rank(A)

ans = 3

>> rank(Ab)

ans = 3

>>>> # es un sistema compatible indeterminado, ya que los rangos son iguales pero distinto que el

>> #n\_incognitas

>> # 5 - 3 = 2 -parametros (depende de dos parametros)

>> # t = alpha

>> # w = beta

>>

>> #8x + 8y + 8z = 32 - 24alpha - 16beta)

c)

>> A = [9 9 9 54; 1 1 -1; 6 -6 0]

error: vertical dimensions mismatch (1x4 vs 1x3)

>> A = [9 9 9; 1 1 -1; 6 -6 0]

A =

9 9 9

1 1 -1

6 -6 0

>> b = [54; 0; 3]

b =

54

0

3

>> rank(A)

ans = 3

>> rank(Ab)

ans = 3

>> #Es un sistema compatible determinado ya que el numero incognitas = rank(A) = rank(Ab)

>> A\b

ans =

1.7500

1.2500

3.0000

>> format rat

>> A\b

ans =

7/4

5/4

3

>> #x=7/4, y=5/4, z=3, Soluciones del sistema compatible determinado

>> #3)

>> A=[4 -5 -1; 1 5 0]

A =

4 -5 -1

1 5 0

>> b= [0; 0]

b =

0

0

>> AB = [A b]

AB =

4 -5 -1 0

1 5 0 0

>> #Es un sistema homogeno.

>>

>> rank(A)

ans = 2

>> rank(AB)

ans = 2

>> rref([A AB])

ans =

1 0 -1/5 1 0 -1/5 0

0 1 1/25 0 1 1/25 0

>>

6)

>> A = [4 1 -1 1; 0 5 1 -1; 0 0 2 3]

A =

4 1 -1 1

0 5 1 -1

0 0 2 3

>> eig(A)

error: eig: A must be a square matrix

>> [P,D] = eig(A)

error: eig: A must be a square matrix

>> A = [4 1 -1 1; 0 5 1 -1; 0 0 2 3]

A =

4 1 -1 1

0 5 1 -1

0 0 2 3

>> [P,D] = eig(A)

error: eig: A must be a square matrix

>> A = [4 1 -1 1; 0 5 1 -1; 0 0 1 1 ;0 0 0 3]

A =

4 1 -1 1

0 5 1 -1

0 0 1 1

0 0 0 3

>> [P,D] = eig(A)

P =

1 5741/8119 3401/9075 -505/922

0 5741/8119 -360/1601 966/5291

0 0 3041/3381 1932/5291

0 0 0 3864/5291

D =

Diagonal Matrix

4 0 0 0

0 5 0 0

0 0 1 0

0 0 0 3

>> eig(A)

ans =

4

5

1

3

>> [P,D] = eig(A)

P =

1 5741/8119 3401/9075 -505/922

0 5741/8119 -360/1601 966/5291

0 0 3041/3381 1932/5291

0 0 0 3864/5291

D =

Diagonal Matrix

4 0 0 0

0 5 0 0

0 0 1 0

0 0 0 3

>> #No es diagonalizable ya que tendria que tener 3 autovectores diferentes

