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18/SCI01/085

COMPUTER SCIENCE

MAT 204

Let A= 1 1 1

1. 2 2
2. 1 2

B= 1 1 3

3 2 1

2 3 2

C= 2 1 3

1. 2 1
2. 1 3
3. Linear transformation of A if vector X= (a, b, c)

A= 1 1 1

1. 2 2

1 1 2

X=

a

b

c

T(X)= a 1

1

1

+b 1

2

1

+c

1

2

2

T(X) =

a

a

a

+ b

2b

b

+

c

2c

c

T(X)=

a + b + c

a + 2b + 2c

a + b + 2c

hence the transformation of

a

b

c

gives

a + b +c

a + 2b + 2c

a + b + 2c

1. Find the rank of (B+C) transpose

B + C

1. 1 3

3 2 1

2 3 2

+

1. 1 3

1 2 1

1. 1 3

B + C=

3 2 6

4 4 2

1. 4 5

(B + C)T =

3 4 4

2 4 4

6 2 5

To find rank :

(B + C)T =3 4 4 -4 2 4 +4 2 4

2 5 6 5 6 2

= 3(20-8) -4(10-24) +4(4-24)

=3(12) -4(-14) +4(-20)

=36 + 56 – 80

= 12

12≠0

Hence the rank of (B + C)T is 3.

1. Check whether A, B & C are singular or non-singular matrix for A.

A = 1 1 1

1. 2 2
2. 1 2

A= 1 2 2 -1 1 2 +1 1 2

1 2 1 2 1 2

= 1(4-2) -1(2-2) +1(2-2)

= 2 – 0 + 0

= 2

2≠0

It is a non-singular matrix

B = 1 1 3

3 2 1

1. 3 2

B = 1 2 1 -1 3 1 +3 3 2

3 2 2 2 2 3

= 1(4-3) -1(6-2) +3(9-4)

= 1 – 4 + 15 = 12

12≠0

It is a non-singular matrix

C = 2 1 3

1. 2 1
2. 1 3

C = 2 2 1 -1 1 1 +3 1 2

1 3 2 3 2 1

= 2(4) – 1(1) +3(-3)

= 6 – 1 – 9  
= -4

-4≠0

It is a non-singular matrix