STEPHEN SMITH ONIMSI

18/SCIO1/088

MAT 204 ASSIGNMENT

Let A = 2. 1. 3 B = 1 1 1

1 0 2 1 0 1

1. 1. 1 1 1 1

C = 1 1 1

1 1 1

0 1 1

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

solution

A = 2. 1. 3 , X = a

1 0 2 b

1 1 1 c

T(x) = a 2 + b 1 + c 3

1 0 2

1 1 1

T(x) = 2a + b + 3c

a 0 2c

a b c

T(x) = 2a + b + 3c

a + 0 + 2c

a + b + c

Hence the transformation of

a gives 2a + b + 3c

b a + 0 + 2c

c a + b + c

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

B+C = 1 1 1 + 1 1 1

1 0 1 1 1 1

1 1 1 0 1 1

B+C = 2 2 2

2 1. 2

1 2 2

(B+C)ᵀ = 2 2 1

2 1 2

2 2 2

To find rank

|(B+C)ᵀ | = 2 1 2 - 2 2 2 + 1 2 1

2 2 2 2 2 2

= 2(2 - 4) – 2(4 - 4) + 1(4- 2)

= 3(-2) – 4(0) + 1(2)

= -6 + 0 +2

= -4

-4 ≠ 0

Hence the Rank of (B+C)ᵀ is 3.

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

For A;

|A|= 2 1 3

1 0 2

1 1 1

|A| = 2 0 2 - 1 1 2 + 3 1 0

1 1 1 1 1 1

= 2(0 – 2) – 1(1 – 2) + 4(1 – 0)

=3(-2) -1(-1) + 3(1)

= -6 + 1 + 3 = -2

-2 ≠ 0

؞It is a non-singular matrices.

For B;

|B| = 1 1 1

1 0 1

1 1 1

|B| = 1 0 1 - 1 1 1 + 1 1 0

1 1 1 1 1 1

|B| = 1(0 – 1) –1(1-1) + 1(1– 0)

=1(-1) – 0 + 1(1)

= -1 – 0 + 1

=0

Since |B|=0

؞It is a -singular matrices.

For C;

|C| = 1 1 1

1 1 1

0 1 1

|C| = 1 1 1 - 1 1 1 + 1 1 1

1 1 0 1 0 1

|C| = 1(1– 1) – 1(1 – 0) + 1(1– 0)

=1(0) – 1(1) + 1(1)

= 0– 1+ 1

=0

؞It is a singular matrix.