23 July 2024

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Matrix sum

To find the sum of 2 matrices A and B. Both the matrices should be of the same dimensions. Mathematically,

C[i][j] = A[i][j] + B[i][j]

Pseudo code

FUNCTION matrix_sum(A,B): Get the number of rows and columns of A Create an empty matrix C with same dimensions FOR each row i: FOR each column j: Set C[i][j] to the sum of A[i][j] and B[i][j] RETURN the matrix C END FUNCTION

Matrix difference

To find the difference of 2 matrices A and B. Both the matrices should be of the same dimensions.

Mathematically,

C[i][j] = A[i][j] - B[i][j]

Pseudo code

FUNCTION matrix_difference(A,B): Get the number of rows and columns of A Create an empty matrix C with same dimensions FOR each row i: FOR each column j: Set C[i][j] to the difference of A[i][j] and B[i][j] RETURN the matrix C END FUNCTION

Matrix multiplication (Projection=> matrix multiplication)

FUNCTION matrix_product(A,B)

Get the number of rows and columns in matrix A.

Get the number of columns in matrix B (no need for rows for matrix B as we have taken the value for the number of rows from matrix A)

Create an empty matrix C with dimensions rows_A x cols_B

FOR each row i in A:

FOR each column in B:

Initialise C[i][j] to 0

FOR each element k in the common dimension

Add the product of A[i][k] and B[k][j] to C[i][j]

RETURN the matrix C

END FUNCTION

 $B[j \times k]$

$C[i][j] = \sum_{i \neq k} (A[i][j] \cdot B[k][j])$

Determinant(Laplace method)

FUNCTION determinant (A): IF the size of A is 2 x 2:

RETURN the difference between the product of the diagonals

END IF

Initialise det to 0

FOR each column C in the first row:

Create a submatrix (basically a minor) by the first row and column c Add to det: product of (-1)^c, A[0][c] and determinant of the submatrix RETURN det

END FUNCTION

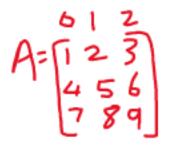
<u>Rank</u>

Number of independent rows and columns Number of non zero rows of a matrix

Steps

- · Convert to Row reduced echleon form
- Count the number of non zero rows available in the matrix

We did 3 problems regarding this Questions => may be direct or indirect



 $|A| = (-1)^0 \times A[0][0] \times \text{submatrix}$ () + (-1)^1 x A[0][1] x submatrix () + (-1)^2 x A[0][2] x submatrix ()

> My notes proceed with caution Akhila Sunesh