

Step-1

Given that columns of a matrix A are n vectors from the set \mathbb{R}^m .

To find the rank of matrix A if they are linearly independent.

Step-2

Rank of a matrix is the number of maximum independent rows = number of maximum independent columns.

Now, if columns of A are n vectors and they all are linearly independent then number of maximum independent columns is n .

Hence, rank of A will be n .

Step-3

Given that columns of a matrix A are n vectors from the set \mathbb{R}^m .

To find the rank of matrix A if they span \mathbb{R}^m .

Step-4

Rank of a matrix is the number of maximum independent rows = number of maximum independent columns.

As the columns of matrix are vector from \mathbb{R}^m and they span \mathbb{R}^m so maximum independent columns is m .

Hence, rank of A will be m .

Step-5

Given that columns of a matrix A are n vectors from the set \mathbb{R}^m .

To find the rank of matrix A if they are a basis for \mathbb{R}^m .

Step-6

Rank of a matrix is the number of maximum independent rows = number of maximum independent columns.

As the columns of matrix are vector from \mathbb{R}^m and they span (basis is the independent set of vectors spanning a vector space) \mathbb{R}^m so independent columns is m .

Hence, rank of A will be m .