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Class :-12(Maths)

Date:- 10.04.2021

Matrices are commonly written in [box brackets](#) or [parentheses](#):

The specifics of symbolic matrix notation vary widely, with some prevailing trends. Matrices are usually symbolized using [upper-case](#) letters (such as **A** in the examples above),^[3] while the corresponding [lower-case](#) letters, with two subscript indices (e.g., a_{11} , or $a_{1,1}$), represent the entries. In addition to using upper-case letters to symbolize matrices, many authors use a special [typographical style](#), commonly boldface upright (non-italic), to further distinguish matrices from other mathematical objects. An alternative notation involves the use of a double-underline with the variable name, with

or without boldface style (as in the case of $\underline{\underline{A}}$).

The entry in the i -th row and j -th column of a matrix **A** is sometimes referred to as the i,j , (i,j) , or (i,j) th entry of the matrix, and most commonly denoted as a_{ij} , or a_{ij} .

Alternative notations for that entry are $A[i,j]$ or A_{ij} . For example, the $(1,3)$ entry of the following matrix **A** is 5 (also denoted a_{13} , $a_{1,3}$, $A[1,3]$ or $A_{1,3}$):

Sometimes, the entries of a matrix can be defined by a formula such as $a_{ij} = f(i, j)$. For example, each of the entries of the following matrix **A** is determined by the formula $a_{ij} = i - j$.

In this case, the matrix itself is sometimes defined by that formula, within square brackets or double parentheses. For example, the matrix above is defined as $\mathbf{A} = [i-j]$, or $\mathbf{A} = ((i-j))$. If matrix size is $m \times n$, the above-mentioned formula $f(i, j)$ is valid for any $i = 1, \dots, m$ and any $j = 1, \dots, n$. This can be either specified separately, or indicated using $m \times n$ as a subscript. For instance, the matrix **A** above is 3×4 , and can be defined as $\mathbf{A} = [i - j] (i = 1, 2, 3; j = 1, \dots, 4)$, or $\mathbf{A} = [i - j]_{3 \times 4}$.

Some programming languages utilize doubly subscripted arrays (or arrays of arrays) to represent an $m \times n$ matrix. Some programming languages start the numbering of array indexes at zero, in which case the entries of an m -by- n matrix are indexed by $0 \leq i \leq m - 1$ and $0 \leq j \leq n - 1$.^[12] This article follows the more common convention in mathematical writing where enumeration starts from 1.

An asterisk is occasionally used to refer to whole rows or columns in a matrix. For example, $a_{i,*}$ refers to the i^{th} row of \mathbf{A} , and $a_{*,j}$ refers to the j^{th} column of \mathbf{A} . The [set](#) of all m -by- n matrices is denoted $\mathbb{R}^{m \times n}$ or $\mathbb{R}^{m,n}$ for real matrices.