

Course N°02 Vectors in MATLAB



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📣 MATLAB°



1. Definition a vector

By default, a vector is a one-dimensional array of numbers. In other words, it is a single row with several

columns or a single column with several rows.

2. Different methods to identify a vector

Before we identify a vector in MATLAB, we must know if the vector:

2.1. Random vector

MATLAB allows you to create an arbitrary vector or called (irregular, random) vector in three ways,

containing different numbers.

- •Each element in the vector with the order
- •All the elements inside a square bracket [] and between each element and the other space
- •All the elements inside a square bracket [] and between each element and the other comma ","

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2.2. Regular vector

MATLAB allows you to create a uniformly spaced vector called a proper (regular) vector in two ways.

- Using the function/command linspace(Xi, Xf, N); which generates N points between Xi and Xf.



- Using the function/command **v** = **Xi** : **Xf**; which generates v vector, with the **first** element
 - Xi, last element Xf, and the difference between elements is any real number St.

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3. Types of the vectors

MATLAB allows you to create two types of vectors which can be stored either:

A row vectors and

A column vectors.

3.1. Row vectors

Are created and/or declared by enclosing the set of elements in square brackets, using space or comma "," to delimit the elements, which can have any number of elements. For example, there are two ways to create a row vector with six elements.



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3.2. Column vectors

Are **created** and/or **declared** by **enclosing** the set of elements in **square brackets**, using a **semicolon** ";" to **delimit** the **elements**. For example, there is **one way** to create a **column vector** with **five elements**.

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4. Other useful MATLAB functions

For vectors, to find the **maximum** and **minimum** values of the vector **x**, we use the command/function **max(.)** and **min(.)**

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To find the summation and the production values of the vector **x**, we use the command/function sum(.) and prod(.)



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The mean of a vector, also **known** as the **average equals** the **sum** of the **vector elements divided** by the **number** of **elements** in the **vector**, we use the command/function **mean(.)**



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To create a vector contain only number "1" or "0", we use the command/function **ones**(\mathbf{r} , \mathbf{c}) and **zeros**(\mathbf{r} , \mathbf{c}); where \mathbf{r} and \mathbf{c} are represent the **row** and **column** respectively.

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List of References

MATLAB A Practical Introduction to Programming and Problem Solving MATLAB A Self-Teaching Guide

MATLAB for Beginners





Mohamed Khider University of Biskra, Algeria Faculty of Sciences and Technology Department of Civil Engineering and Hydraulics 2nd Year Civil Engineering / Hydraulics / Public Works



