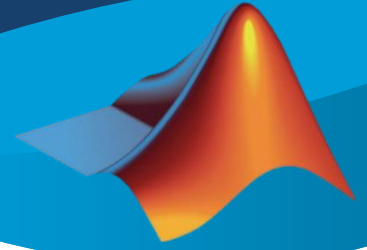


# Elementary topics in MATLAB

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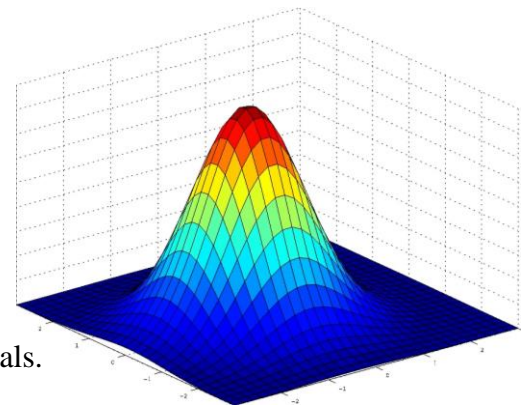
Millions of engineers and scientists worldwide use MATLAB to analyze and design the systems and products transforming our world. The matrix-based MATLAB language is the world's most natural way to express computational mathematics. Built-in graphics make it easy to visualize and gain insights from data.

## + Introduction to arrays and matrices in MATLAB

- Creating different types of matrices in MATLAB.
- Manipulation of matrices in MATLAB.
- *Plot* in MATLAB

## + Working with polynomials

- Learning how to represent a polynomial in MATLAB
- Creating, solving, differentiating and integrating polynomials.



## + Conditional statements

- Logical expressions
- The *if* conditional structure

## + Creating “for” and “while” loops in MATLAB.

- Syntax of the *for* loop and solving some interesting examples.
- Syntax of the *while* loop and presenting some insightful samples.

## + Applications of functions in MATLAB.

- The importance of functions in computer programming.
- Learning how to create a function in MATLAB

## + Numerical solution of initial value and boundary value problems using MATLAB solvers.

- Using *ode45* for solving initial value ordinary differential equations.
- Numerical solution of boundary value problems using *bvp4c* solver

## + Constrained optimization using genetic algorithm.