Features of MATLAB

1. High-Level Language

This is a high-level programming language with **data structures**, control flow statements, functions, output/input, and object-oriented programming. It permits both, rapidly creating speedy throw-away programs, and creating complete, complex and large application programs.

2. Interactive Environment

MATLAB provides an interactive environment that allows iterative exploration, design, and problem-solving. It is a bunch of tools that a programmer can use. It includes abilities for handling the variables in the workspace & importing/exporting data. It also contains tools for development, handling, debugging, and profiling MATLAB files.

3. Handling Graphics

It offers built-in graphics useful for data visualizing, and tools for generating custom plots. MATLAB holds high-level instructions specially for creating two and three-dimensional data visualizations, animations, image processing, and graphical presentation. This moreover includes low-level instructions that allow users to fully modify the appearance of graphics on top of to build thorough **GUIs (Graphical User Interfaces)** on MATLAB.

4. Mathematical Functions Library

It offers a huge library of mathematical functions needed for computing statistics, linear algebra, numerical integration, filtering, Fourier analysis, optimization and solving regular differential equations.

5. Application Program Interface (API)

MATLAB APIs allow users to write C / C++ and Fortran programs that directly interact with MATLAB. These include options for calling programs from MATLAB (dynamic linking),

reading and writing MAT-files, and for calling MATLAB as a computational engine. The users can utilize MEX API and Matrix API functions to interact with data within the MATLAB workspace.

6. Toolboxes

A ” Toolbox” is a set of functions designed for a specific purpose and compiled as a package. These Toolboxes include MATLAB code, apps, data, examples and the documentation which helps users to utilize each Toolbox. Users can compile MATLAB files to create toolboxes if they require sharing with others. There are separate Toolboxes available from Mathworks, to be used for specific purposes, for example, text analytics, image processing, signal processing, deep learning, statistic & machine learning, and many more.

7. Accessing Data

MATLAB can natively support the sensor, video, image, telemetry, binary, and various real-time data from JDBC/ODBC databases. Reading data from different databases, CSV, audio, images, and video is super simple from an integrated environment.

8. Interfacing with Other Languages

Libraries written in Perl, Java, ActiveX or .NET can be directly called from MATLAB, and many libraries for XML or SQL support can be employed as wrappers around Java or ActiveX libraries.

9. Data Processing

A vast library of mathematical functions for linear algebra, Fourier analysis, filtering, statistics, optimization, numerical integration and solving ordinary differential equations. MATLAB’s

numeric routines scale openly to parallel processing over clusters and clouds. Parallel Computing Toolbox distributes training across multicore CPUs graphical processing units (GPUs), and clusters of computers with multiple CPUs and GPUs.

10. Machine Learning, Neural Networks, Beyond Statistics

Deep Learning Toolbox provides simple MATLAB commands for creating and interconnecting the layers of a deep neural network. MATLAB provides an ML-rich language library, allowing the script to be very short and equally effective as compared to other languages. Automated feature selection and built-in hyper-parameter tuning make fine-tuning the machine learning and deep learning models easy.

11. Text Analytics

Text Analytics Toolbox offers algorithms for pre-processing, visualizing, analyzing, and modeling textual data. It contains tools for handling raw textual data from sources such as news feeds, equipment logs, surveys, social media, and even operator reports. Models created with this toolbox can be used in applications such as sentiment analysis, and topic modeling. Models created with the Text Analytics Toolbox can also be combined with features from other data sources for building machine learning models that use numeric, textual and other data types.

12. Multi-Platform Deployment

MATLAB allows to ‘export’ machine learning models anywhere including Java, Microsoft .NET, Excel, Python, C/C++, CUDA (parallel computing platform and programming model developed by Nvidia), enterprise IT systems, or the cloud. Or deploy models to MATLAB Production Server for integration with web, desktop, database, and enterprise applications.