Octave is an open-source programming language for numerical computations. It provides a high-level interface that is compatible with MATLAB. It is used by engineers, scientists, and researchers.

Key features of Octave include:

- **Numerical Computation**: It supports various numerical methods, including matrix operations, optimization, and integration etc..
- **Matrix Manipulation**: Octave is designed for matrix operations, making it easy to work with vectors and matrices, which are fundamental in many mathematical computations.
- **File I/O Support**: Octave can read from and write to various data formats, including CSV, text files, and binary files, facilitating data import and export.
- **Scripting**: You can write scripts to automate tasks and perform complex calculations.
- **Visualization**: It offers tools for plotting data and functions in 2D and 3D like plot(), pie(), scatter(), hist(), subplots() etc
- **Community and Documentation**: Being open-source, it has strong community and extensive documentation, which can help users find solutions and learn more about the language.
- **Extensibility**: Users can create functions and packages to extend its capabilities.
- **Cross-Platform**: Octave runs on various operating systems, including Windows, macOS, and Linux
- **Compatibility with MATLAB**: Many Octave functions and syntax are similar to MATLAB, allowing users to easily transition between the two platforms.

Difference between Octave & Matlab

Octave	Matlab
Free and open-source.	Commercial software that requires a paid license.
Generally compatible with MATLAB syntax and functions, but some advanced features may differ.	Offers additional proprietary toolboxes and functions that may not be available in Octave.
The GUI is less polished compared to MATLAB.	Provides a more user-friendly interface with advanced debugging tools, built-in help, and better visualization options.
slower for certain operations compared to MATLAB.	Generally optimized for performance, especially with large datasets and complex computations.

Community-driven support through forums and documentation. Limited commercial support.	Official support from MathWorks, extensive documentation, and a large user community.