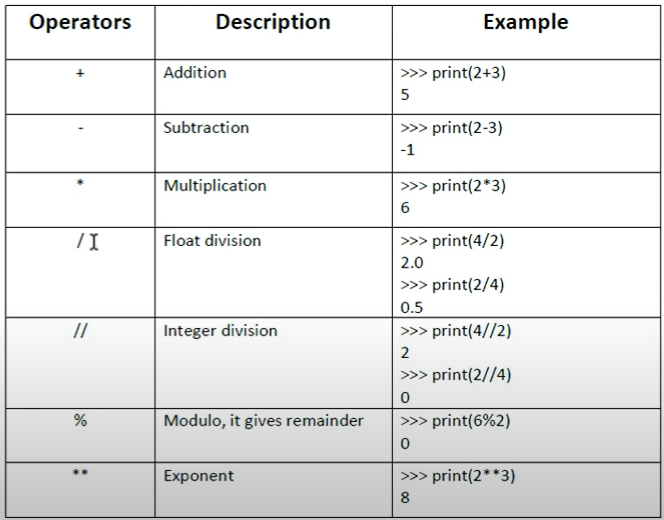
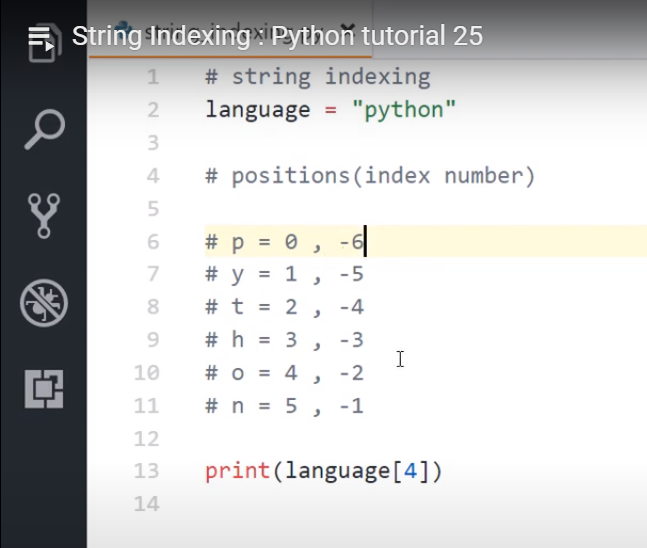
V 14:

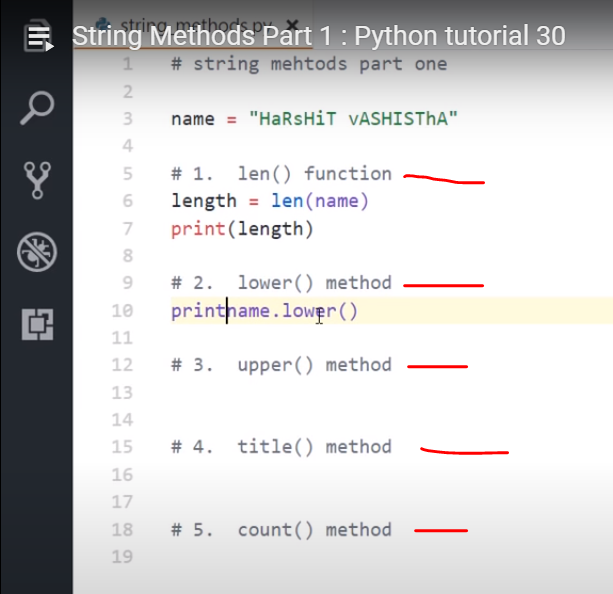


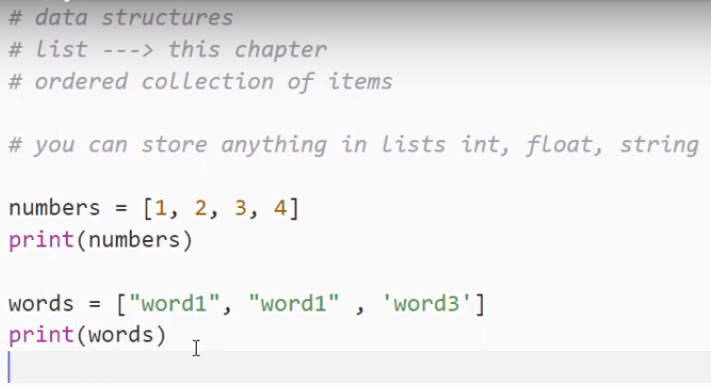
Precedence rule:



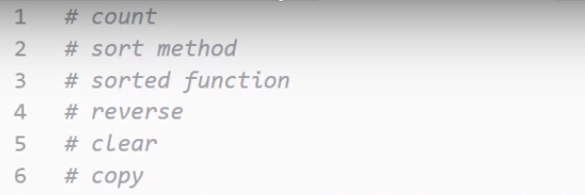
String indexing:



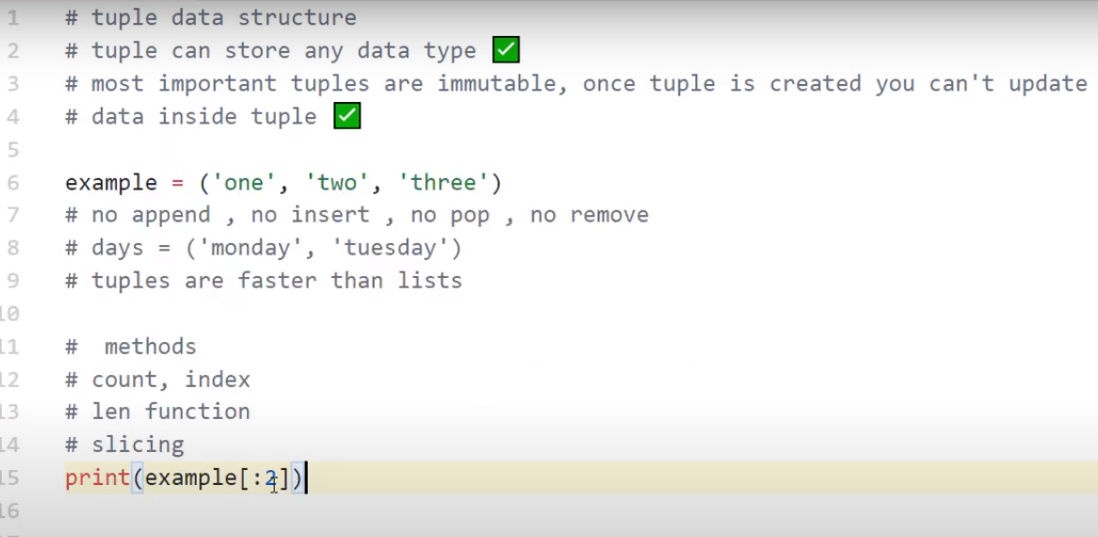




Useful list methods: -



Tuples: -



Args: -

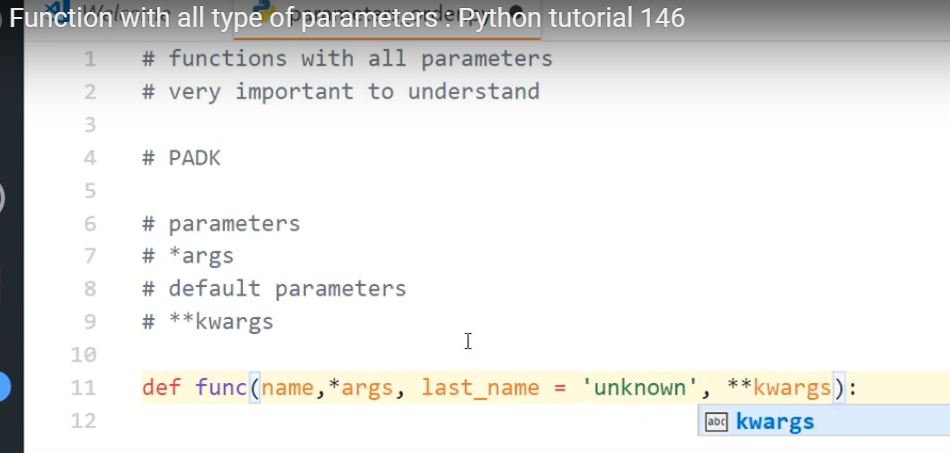
Function parameters order:

Parameters,

\*args,

default parameters,

\*\*kwargs



**Pandas:**

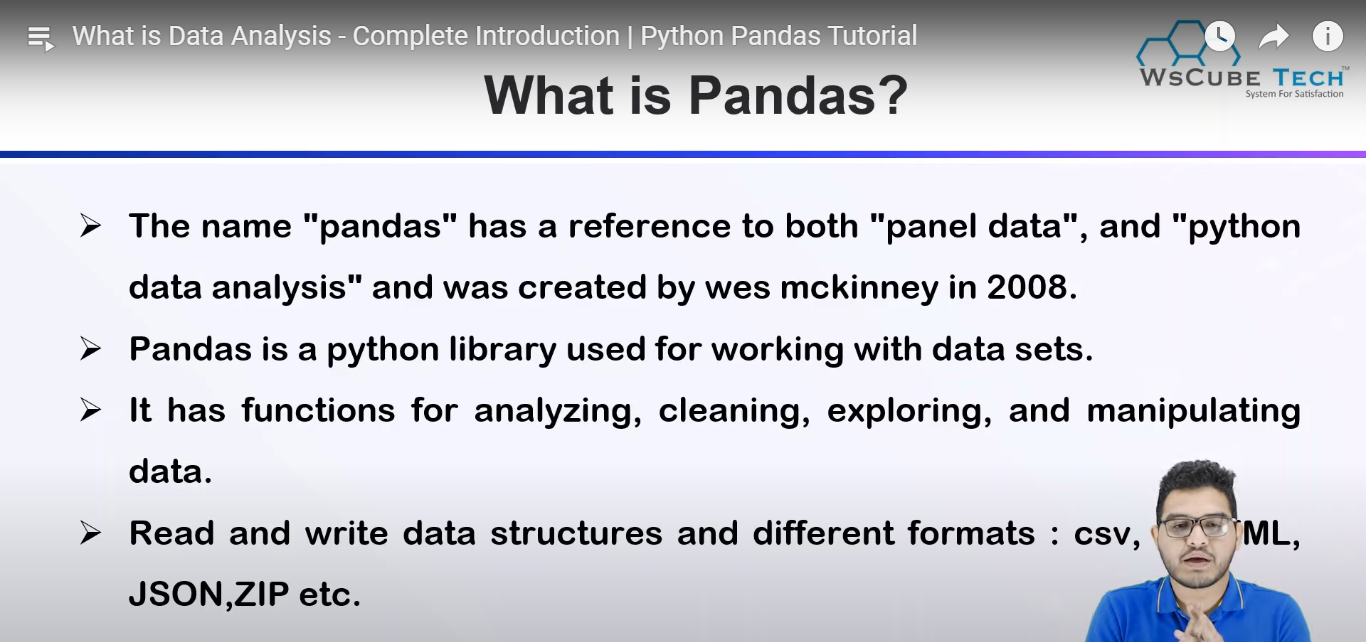
Popular libraries:

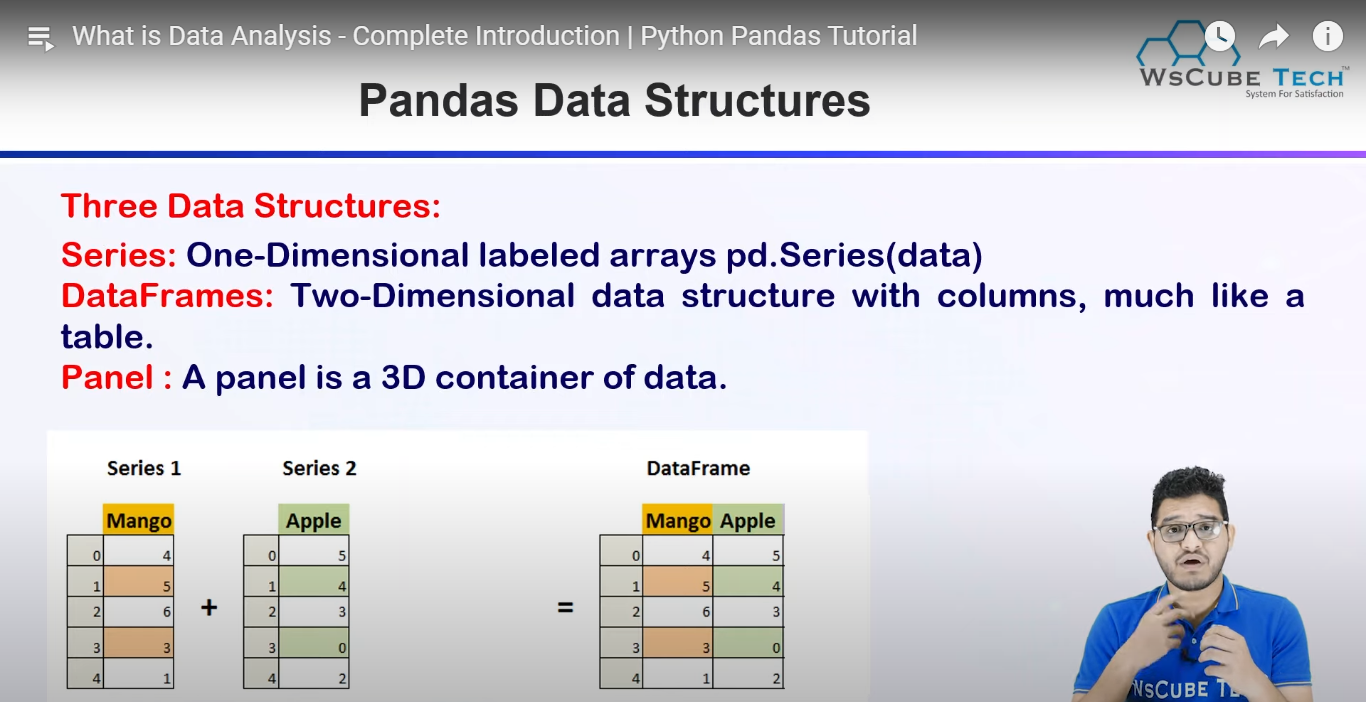
1. Numpy:
   1. Numpy is a fundamental for numerical calculations in Python and is widely used in AI, ML and DL for handling arrays, matrices, and mathematical operations.
   2. It is used for data preprocessing, manipulation, and transformation before feeding data into ML/DL models.
2. Statsmodels:
   1. Statsmodels is used for statistical modeling and hypothesis testing in AI and ML projects.
   2. It is often used for regression analysis, time series analysis, and statistical tests to understand relationships in data and validate assumptions.
3. Matplotlib and Seaborn:
   1. Matplotlib and seaborn are used for data visualization in AI, ML and DL projects.
   2. Matplotlib is a versatile library for creating static, interactive, and publication-quality plots and charts.
   3. Seaborn is built on top of Matplotlib and provides a high-level interface for creating attractive statistical graphics.
4. Scipy:
   1. Scipy is used for scientific and technical computing in Python.
   2. It includes modules for optimization, integration, interpolation, linear algebra, and more which are used in AI, ML and DL algorithms.
5. Scikit-learn:
   1. Scikit-learn is one of the most popular ML libraries in Python and is used extensively for building ML models.
   2. It provides tools for data preprocessing, feature selection, model training, evaluation and hyperparameter tuning.
   3. Common algorithms like classification, regression, clustering, dimensionality-reduction, and ensemble methods are implemented in Scikit-learn.
6. Pandas:
   1. Pandas is used for data manipulation and analysis in AI, ML and DL projects.
   2. It is used for loading and cleaning data, handling missing values, transforming data, and preparing datasets for ML models.

Here's a brief overview of where these libraries fit into the AI/ML/DL workflow:

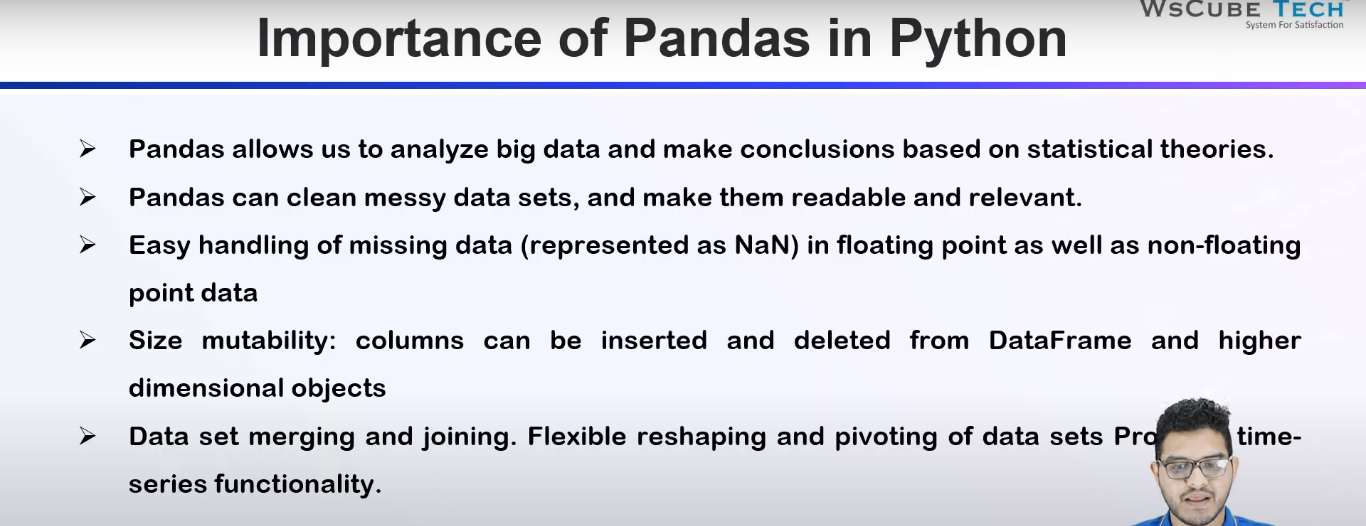
1. Data Preprocessing: NumPy, Pandas
2. Data Visualization: Matplotlib, Seaborn
3. Statistical Analysis: Statsmodels, Scipy
4. Machine Learning: Scikit-learn (for traditional ML algorithms)
5. Deep Learning: NumPy (for low-level operations), TensorFlow, PyTorch (for DL frameworks)

You may also use combinations of these libraries depending on the specific tasks and projects you are working on.

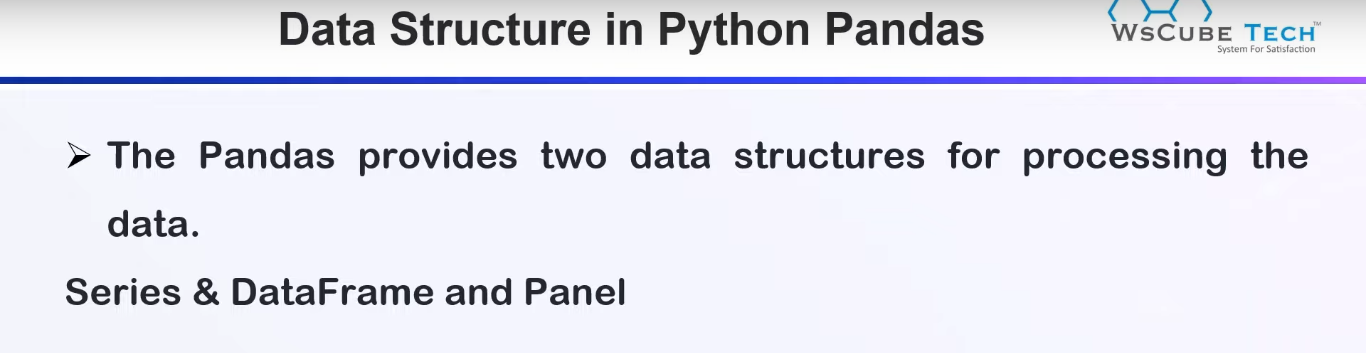




Importance of pandas:



Data structures in pandas:



Series data structure:

