

# PANDAS

## 1. DataFrame Creation and Inspection

- **pd.DataFrame()**: Create a DataFrame from various data sources (lists, dictionaries, etc.).
- **pd.Series()**: Create a Series object.
- **df.head()**: Return the first n rows of the DataFrame.
- **df.tail()**: Return the last n rows of the DataFrame.
- **df.info()**: Summary of DataFrame including the index dtype and columns.
- **df.describe()**: Generate descriptive statistics of the DataFrame.
- **df.shape**: Return a tuple representing the dimensionality of the DataFrame.
- **df.columns**: Return the column labels of the DataFrame.
- **df.index**: Return the index (row labels) of the DataFrame.

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- **`df.loc[]`**: Access a group of rows and columns by labels or a boolean array.
- **`df.iloc[]`**: Access a group of rows and columns by integer position.
- **`df.at[]`**: Access a single value for a row/column label.
- **`df.iat[]`**: Access a single value for a row/column position.
- **`df.query()`**: Query the DataFrame using a boolean expression.
- **`df.filter()`**: Filter the DataFrame by specific criteria.

### 3. Data Cleaning and Manipulation

- **`df.drop()`**: Remove rows or columns by label.
- **`df.dropna()`**: Remove missing values.
- **`df.fillna()`**: Fill missing values.
- **`df.replace()`**: Replace values with another value.
- **`df.rename()`**: Rename labels of rows or columns.
- **`df.duplicated()`**: Detect duplicate rows.

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- **`df.sort_values()`**: Sort by the values along either axis.
- **`df.sort_index()`**: Sort by the DataFrame's index.
- **`df.set_index()`**: Set the DataFrame index using one or more columns.
- **`df.reset_index()`**: Reset the index of the DataFrame.

### 4. Data Aggregation and Grouping

- **`df.groupby()`**: Group DataFrame using a mapper or by a series of columns.
- **`df.agg()`**: Aggregate using one or more operations over the specified axis.
- **`df.transform()`**: Transform data by applying a function.
- **`df.pivot_table()`**: Create a pivot table.
- **`df.crosstab()`**: Compute a cross-tabulation of two or more factors.

### 5. Merging and Joining

- **`pd.merge()`**: Merge DataFrames based on one or more keys.
- **`df.join()`**: Join DataFrames based on the index or a key column.

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- `pd.merge_asof()`: Perform an asof merge.

### 6. Data Visualization

- `df.plot()`: Plot DataFrame using matplotlib.
- `df.hist()`: Plot histograms.
- `df.boxplot()`: Generate a box plot.

### 7. Time Series

- `pd.to_datetime()`: Convert argument to datetime.
- `df.resample()`: Resample time series data.
- `df.shift()`: Shift the index by a specified number of periods.

### 8. Input/Output

- `pd.read_csv()`: Read a comma-separated values (csv) file into DataFrame.
- `pd.read_excel()`: Read an Excel file into DataFrame.
- `df.to_csv()`: Write DataFrame to a CSV file.

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### 9. Statistical Functions

- **`df.mean()`**: Return the mean of the values.
- **`df.median()`**: Return the median of the values.
- **`df.std()`**: Return the standard deviation of the values.
- **`df.sum()`**: Return the sum of the values.
- **`df.min()`**: Return the minimum value.
- **`df.max()`**: Return the maximum value.

### 10. Other Functions

- **`df.apply()`**: Apply a function along an axis of the DataFrame.
- **`df.applymap()`**: Apply a function to each element of the DataFrame.
- **`df.map()`**: Map values using an input mapping function.
- **`df.astype()`**: Convert the DataFrame to a specified type.