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# PANDAS

## POWERHOUSE

Data Analysis & Manipulation Excellence

**60+**

Functions

**6**

Categories

**GB**

Scale

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# Data Loading

`pd.read_csv()`

Load CSV files into pandas DataFrame

`pd.read_excel()`

Import Excel spreadsheets with multiple sheets

`pd.read_json()`

Parse JSON data from files or strings

`pd.read_sql()`

Execute SQL queries and load results

`pd.read_parquet()`

Load columnar Parquet files efficiently

`pd.read_html()`

Extract tables from HTML pages

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# Data Inspection

## `df.info()`

Display DataFrame structure and memory usage

## `df.describe()`

Generate statistical summary of data

## `df.head() / df.tail()`

Preview first or last rows of data

## `df.shape`

Return dimensions as rows and columns

## `df.dtypes`

Show data types for each column

## `df.unique()`

Count unique values in each column

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# Data Selection

**df.loc[]**

Label-based data selection and filtering

**df.iloc[]**

Integer position-based data selection

**df.query()**

Filter rows using string expressions

**df.filter()**

Select columns based on label patterns

**df.sample()**

Randomly sample rows from DataFrame

**df.nlargest() / df.nsmallest()**

Get top n largest or smallest values

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# Data Cleaning

## `df.dropna()`

Remove rows with missing values

## `df.fillna()`

Replace missing values with specified data

## `df.drop_duplicates()`

Remove duplicate rows from DataFrame

## `df.replace()`

Replace specific values with new ones

## `df.astype()`

Convert DataFrame columns to different types

## `pd.to_datetime()`

Parse strings into datetime objects

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# Data Transformation

## `df.apply()`

Apply custom functions along DataFrame axes

## `df.map()`

Transform values using mapping or function

## `df.pivot_table()`

Create spreadsheet-style pivot tables

## `df.melt()`

Transform from wide to long format

## `df.sort_values()`

Sort DataFrame by column values

## `df.reset_index()`

Reset DataFrame index to default

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# Aggregation & Grouping

`df.groupby()`

Group DataFrame by column values

`df.agg()`

Apply multiple aggregation functions

`df.sum() / df.mean()`

Calculate column-wise sum or average

`df.value_counts()`

Count unique values in Series

`pd.crosstab()`

Compute cross-tabulation of factors

`df.rolling()`

Create rolling window calculations

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# Pro Tips for Pandas Mastery

Pandas transforms raw data into actionable insights through powerful manipulation tools! Master vectorized operations over loops for performance, understand memory optimization with categorical data types, and leverage method chaining for readable code. Use .loc and .iloc appropriately, handle missing data strategically, and remember: efficient pandas code thinks in terms of entire columns and DataFrames!

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