Pandas Cheatsheet

Pandas setup

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Pandas is open source package for data science/data analysis

`pip install pandas`	Install Pandas library
`import pandas as pd`	Import Pandas
`df = (pd.melt(df) .rename(columns={'variable': 'var'}) .query('val >= 200') )`	Method Chaining
`df[(df['col_1']=='a')& (df['col_2']>=10)]`	Pandas syntax

Data Structures

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Pandas has two data structures: Series (1 dimension) and DataFrame (multidimensional)

Series DataFrame

`s = pd.Series(['a', 'b', 'c'], index=[0 , 1, 2])`	Create new Series
`df = pd.DataFrame( {'col_1': [11, 12, 13], 'col_2': [21, 22, 23], 'col_3': [31, 32, 33]}, index=[0, 1, 2])`	Create new DataFrame

Read

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Import data from CSV, Excel, JSON, SQL, HTML, web

`pd.read_csv(filename)`	From a CSV file
`pd.read_csv(filename, header=None, nrows=5)`	From a CSV file with parameters
`pd.read_excel(filename)`	From an Excel file
`pd.read_sql(query, connection_object)`	Reads from a SQL table/database
`pd.read_json(json_string)`	Reads from a JSON formatted string, URL or file.

Write

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Write data to CSV, Excel, JSON, HTML

`df.to_csv(filename)`	Writes to a CSV file
`df.to_excel(filename)`	Writes to an Excel file
`df.to_json(filename)`	Writes to a file in JSON format
`df.to_html(filename)`	Saves as an HTML table

Inspect Data

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View stats, samples and summary of the data

`df.head(n)`	First n rows
`df.tail(n)`	Last n rows
`df.shape`	Number of rows and columns
`df.info()`	Index, Datatype and Memory information
`df.describe()`	Summary statistics for numerical columns
`s.value_counts(dropna=False)`	(Series) Views unique values and counts
`df.sample(n)`	Randomly select n rows.
`df.nlargest(n, 'col_1')`	Select and order top n entries for column
`df.nsmallest(n, 'col_1')`	Select and order bottom n entries
`df.quantile([0.25,0.75])`	Quantiles of each object

Select

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Select data by index, by label, get subset

`s.loc[0]`	(Series) Select by index
`s.iloc[0]`	(Series) Select by position
`df['col_1']`	Get single column as Series
`df[['col_1', 'col_2']]`	Get multiple columns as a DataFrame
`df.iloc[0,:]`	Select first row from DataFrame
`df.iloc[0,0]`	First element of first column
`df.loc[df['col_1'] > 10, ['col_1', 'col_2']]`	Select rows meeting logical condition, and only the specific columns
`df.iat[1, 2]`	Access single value by index
`df.at[3, 'col_2']`	Access single value by label

Add rows/columns

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Add new values to existing DataFrame

`df['new col'] = df['col'] * 100`	Add new column based on other column
`df['new col'] = False`	Add new column single value
`df.loc[-1] = [1, 2, 3]`	Add new row at the end of DataFrame
`df.append(df2, ignore_index = True)`	add rows from DataFrame to existing DataFrame

Drop rows/columns/nan

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Drop data from DataFrame

`s.drop([0, 1])`	(Series) Drop values from Series by index (row axis)
`df.drop('col_1' , axis=1)`	Drop column by name col_1 (column axis)
`df.dropna()`	Drops all rows that contain null values
`df.dropna(axis=1)`	Drops all columns that contain null values
`df.dropna(axis=1,thresh=n)`	Drops all rows have have less than n non null values

Sort values/index

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Sort and rank values/index by one or multiple criteria

`df.sort_values(by='col_1', ascending=False)`	Sort values by column, ascending order
`df.sort_values(by=['col_1', 'col_2'])`	Sort values by columns
`df.sort_index(ascending=False)`	Sort object by labels (along an axis) in descending order
`df.sort_values(by=[('col_1', 'col_2')])`	Sort multindex by multiple levels
`df.reset_index()`	Reset the index of the DataFrame, moving index to columns

Filter

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Filter data based on multiple criteria

`df[df['col_1'] > 100]`	Values greater than X
`df[(df['col_1']=='a')& (df['col_2']>=10)]`	Filter Multiple Conditions - & - and; | - or
`df[df['date'] > '2022-02-22']`	Date filtering
`df[df['date'].dt.month == 2]`	Filter with dt attributes
`df[df['col_1'].str.contains('pan*', regex=True)]`	Filter by regex
`df[df['col_1'].isin(['pan', 'das'])]`	Filter based on list of values
`df.query('col_1 > 100')`	Filter by queries
`df.query('col_1 > 100 and col_2 = 0')`	Filter by multiple queries

Group by

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Group by and summarize data

`df.groupby('col_1')`	Group by single column - return pandas.core.groupby.DataFrameGroupBy
`df.groupby(['col_1', 'col_2'])`	Group by multiple columns
`df.groupby('col_1').groups`	View groups
`df.groupby('col_1').get_group(1)`	Get group
`df.groupby('col_1').count()`	Get count per groups
`df.groupby('col_1').agg([np.sum, np.mean])`	Apply multiple agg functions on group
`df.groupby('col_1').filter(lambda x: len(x) >= 5)`	Filter groups
`df.groupby('col_1').agg('count')`	Aggregate group using function.
`df.groupby('col_1').rank(method='dense')`	Compute numerical data ranks (1 through n) along axis.

Convert

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Convert to date, string, numeric

string → date
string → number

`df['points'].astype(str)`	convert to string
`df['col_1'].astype('int64')`	convert to int64
`df['col_1'].astype(float)`	convert to float
`pd.to_numeric(df['col_1'], errors='coerce')`	convert to numeric
`pd.to_datetime(df['date'], format='%Y-%m-%d')`	convert string to date
`pd.DataFrame(df['Values'].tolist(), columns=['col_1', 'col_1'])`	Split column list to multiple columns
`df['col_1'].apply(pd.Series)`	Expand Series of dictionnaries

Merge & Concat

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Merging, joniing and concatenating 2 and more DataFrames

`df1.append(df2)`	Adds the rows in df1 to the end of df2 (columns should be identical)
`pd.concat([df1, df2],axis=1)`	Adds the columns in df1 to the end of df2 (rows should be identical)
`df1.join(df2,on=col1,how='inner')`	SQL-style joins the columns in df1 with the columns on df2 where the rows for col have identical values. how can be one of 'left', 'right', 'outer', 'inner'

Apply

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Applying functions to a column or DataFrame; lambda functions

`def calc(x): return x + 1 df.apply(calc, axis = 1)`	Apply function to DataFrame
`df[['col_1','col_2']].apply(calc)`	Apply to multiple columns
`df.apply(lambda x: x * -1 if x < 0 else x)`	Apply lambda

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