



Data Science Cheat Sheet

Pandas

KEY

*We'll use shorthand in this cheat sheet***df** - A pandas DataFrame object**s** - A pandas Series object

IMPORTS

*Import these to start***import pandas as pd****import numpy as np**

IMPORTING DATA

pd.read_csv(filename) - From a CSV file**pd.read_table(filename)** - From a delimited text file (like TSV)**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.**pd.read_html(url)** - Parses an html URL, string or file and extracts tables to a list of dataframes**pd.read_clipboard()** - Takes the contents of your clipboard and passes it to **read_table()****pd.DataFrame(dict)** - From a dict, keys for columns names, values for data as lists

EXPORTING DATA

df.to_csv(filename) - Writes to a CSV file**df.to_excel(filename)** - Writes to an Excel file**df.to_sql(table_name, connection_object)** - Writes to a SQL table**df.to_json(filename)** - Writes to a file in JSON format**df.to_html(filename)** - Saves as an HTML table**df.to_clipboard()** - Writes to the clipboard

CREATE TEST OBJECTS

*Useful for testing***pd.DataFrame(np.random.rand(20,5))** - 5 columns and 20 rows of random floats**pd.Series(my_list)** - Creates a series from an iterable **my_list****df.index = pd.date_range('1900/1/30', periods=df.shape[0])** - Adds a date index

VIEWING/INSPECTING DATA

df.head(n) - First **n** rows of the DataFrame**df.tail(n)** - Last **n** rows of the DataFrame**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)** - Views unique values and counts**df.apply(pd.Series.value_counts)** - Unique values and counts for all columns

SELECTION

df[col] - Returns column with label **col** as Series**df[[col1, col2]]** - Returns Columns as a new DataFrame**s.iloc[0]** - Selection by position**s.loc[0]** - Selection by index**df.iloc[0,:]** - First row**df.iloc[0,0]** - First element of first column

DATA CLEANING

df.columns = ['a', 'b', 'c'] - Renames columns**pd.isnull()** - Checks for null Values, Returns Boolean Array**pd.notnull()** - Opposite of **s.isnull()****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**df.fillna(x)** - Replaces all null values with **x****s.fillna(s.mean())** - Replaces all null values with the mean (mean can be replaced with almost any function from the statistics section)**s.astype(float)** - Converts the datatype of the series to float**s.replace(1, 'one')** - Replaces all values equal to 1 with 'one'**s.replace([1,3], ['one', 'three'])** - Replaces all 1 with 'one' and 3 with 'three'**df.rename(columns=lambda x: x + 1)** - Mass renaming of columns**df.rename(columns={'old_name': 'new_name'})** - Selective renaming**df.set_index('column_one')** - Changes the index**df.rename(index=lambda x: x + 1)** - Mass renaming of index

FILTER, SORT, & GROUPBY

df[df[col] > 0.5] - Rows where the **col** column is greater than 0.5**df[(df[col] > 0.5) & (df[col] < 0.7)]** - Rows where 0.7 > col > 0.5**df.sort_values(col1)** - Sorts values by **col1** in ascending order**df.sort_values(col2, ascending=False)** - Sorts values by **col2** in descending order**df.sort_values([col1, col2], ascending=[True, False])** - Sorts values by**col1** in ascending order then **col2** in descending order**df.groupby(col)** - Returns a groupby object for values from one column**df.groupby([col1, col2])** - Returns a groupby object values from multiple columns**df.groupby(col1)[col2].mean()** - Returns the mean of the values in **col2**, grouped by the values in **col1** (mean can be replaced with almost any function from the statistics section)**df.pivot_table(index=col1, values=[col2, col3], aggfunc=mean)** - Creates a pivot table that groups by **col1** and calculates the mean of **col2** and **col3****df.groupby(col1).agg(np.mean)** - Finds the average across all columns for every unique column 1 group**df.apply(np.mean)** - Applies a function across each column**df.apply(np.max, axis=1)** - Applies a function across each row

JOIN/COMBINE

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 **col1** have identical values. **how** can be one of 'left', 'right', 'outer', 'inner'

STATISTICS

*These can all be applied to a series as well.***df.describe()** - Summary statistics for numerical columns**df.mean()** - Returns the mean of all columns**df.corr()** - Returns the correlation between columns in a DataFrame**df.count()** - Returns the number of non-null values in each DataFrame column**df.max()** - Returns the highest value in each column**df.min()** - Returns the lowest value in each column**df.median()** - Returns the median of each column**df.std()** - Returns the standard deviation of each column