Numpy, Pandas Basics – Learning made easy



(import numpy as np)

NumPy Press tab after '.' for method options. Shift+tab for more info on a method.

pandas |

Series



(import pandas as pd)

• Built on top of Numpy, Contains labelled data

1. Creating Numpy Arrays

np.arange() - sequence of numbers
np.random.rand() - random numbers
(several other np.random. modules available)
np.linspace() - to create equally spaced numbers
np.array(list or tuple) - to convert list or tuple into array.

2. Attributes of Arrays

my_arr.ndim - for number of dimensions of array
my_arr.shape - for the shape of the array (dimensions)
my_arr.reshape() - to reshape an array

3. Indexing/Slicing

my_arr[start:stop:step] - for 1D array
my_arr[Start:stop:step , start:stop:step] - for 2D array

4. Boolean Masking

my_arr[conditional] - for 1D array
my_arr[conditional, :] - for 2D array

5. Modifying an array

my_arr[row, column] = value
my_arr[:,column] = [values]
np.vstack(my_arr1, my_arr2) - stacking array in rows
np.hstack(my_arr1, my_arr2) - stacking array in columns
np.vsplit(my_arr, [indices]) - vertical split at indices
np.hsplit(my_arr,[indices]) - horizontal split at indices

6.Ufuncs

my_arr*n – multiplies each element of array with n (similarly operators like +, -, /, **, can be directly applied) np.sum(), np.mean(), np.max(), np.argmax(), np.abs(), etc np.sort() - sorts the values in an array np.argsort() – sorts the array, and returns the indices. np.where(value) – returns indices where value is present (For all available methods np. Tab)

1. Creating Pandas Series

pd.Series(list or tuple or array or dictionary)
my_series.shape – for the dimensions
my_series.index – for the index names

2. Indexing/Slicing

my_series.loc[index name] - indexing by names my_series.iloc[start:stop:step] - by index position Masking, modifying similar to dataframes.

DataFrame

1. Creating a Pandas DataFrame

pd.DataFrame(2D np array or dictionary of (lists or series or dictionaries) or csv files) df.shape – for the dimensions df.columns – get column names df.index – get row or index names df.info() – for brief info on the data frame df.describe() – for brief statistics on numeric columns df.reset_index() – resets index df.set_index(index) – sets new index. Index can be a col df.rename() – to rename column values.

2. Indexing/Slicing/masking

df.loc[index names, col names] - indexing by names
(for multiple row names or col names, pass in a list)
df.iloc[start:stop:step, star:stop:step] - by position
df[col names] - for indexing on column names
df.loc[conditional,:] - for Boolean masking

3. Modification of array

df[col name] = [values]
df.assign(values) – to add new columns
df.drop(col or row name, axis)- to drop columns or rows
df.pop(col name) - will drop a column
pd.concat([df1,df2],axis) – concatenate rows or columns
pd.merge(df1,df2) – to merge on a common column
(several more options for merge) pd.merge SHIFT+Tab

DataFrame (continued...)

4. Few Important Series & DataFrame Methods df.max(axis) – max of each column or row df.idxmax(axis) - index where value is max df.min(), df.idxmin(), df.sum(), df.count() etc..

df.apply(func, axis) – apply a func over each col or row

df[col name].unique() - to get unique values in a column
df[col name].nunique() - # of unique values in a column
df[col name].value counts() -unique value and frequency

df.sort_values(col name,axis)- sort df based on given col
df[col name].sort values() - will sort values in a column

df.grouby(col name) - will create a groupby object on
which we can use several other aggregation methods.
df.groupby(col name).mean() - will group by a col values
and obtains mean of each group for all columns
df.groupby(col1)[col2].mean() - will group by a col1
values and obtains mean of each group for col2

5. Missing Values

df.isna(), df.isnull() - returns a Boolean data frame
df.notna(), df.notnull() - returns a Boolean data frame
df.isnull().sum(0) - returns a count of all missing values in
each column

df.dropna(axis) – drops NaN values in col or rows df.fillna(value, method, axis) – fill missing values

6. Numerical operations

Similar to numpy operations. Any Ufunc will also work on data frames or series.

7. Reading, writing files

pd.read_csv(), read_table() - to read a 'csv' file, 'txt' file
pd.read_excel() - to read excel file
df.to_csv() - to write a file

Few other important methods:
Enumerate() – takes a list and gives index or number to each element in the list
Import string – this has some additional methods like 'string.punctuation' (which has all punctuations in it)