

DataFrames

- A pandas object that is used to store a dataset
- Information is organized in rows and columns
- Dataframes simplify common operations, like sorting data

Series

- A pandas object used to create dataframes
- Seen as a one-dimensional of data
 - Think of

```
Constructing Series from a dictionary with an Index specified

>>> d = {'a': 1, 'b': 2, 'c': 3}
>>> ser = pd.Series(data=d, index=['a', 'b', 'c'])
>>> ser
a    1
b    2
c    3
dtype: int64

Constructing Series from a list with copy=False.

>>> r = [1, 2]
>>> ser = pd.Series(r, copy=False)
>>> ser.iloc[0] = 999
>>> r
[1, 2]
>>> ser
0    999
1     2
dtype: int64
```

Indexing into Dataframes

- Main Techniques:
 - `df.loc[]`
 - `Df.iloc[]`

Main Techniques:

1. `df.loc[]`
2. `df.iloc[]`

Name	Indexing Pattern
<code>loc</code>	<code>name.loc[row_label, col_label]</code>
<code>iloc</code>	<code>name.iloc[row_index, col_index]</code>

```
>>> df = pd.DataFrame([1, 2], [4, 5], [7, 8]),
... index=['cobra', 'viper', 'sidevinder'],
... columns=['max_speed', 'shield'])
>>> df
   max_speed  shield
cobra       1       2
viper       4       5
sidevinder  7       8
```

Single label. Note this returns the row as a Series.

```
>>> df.loc['viper']
max_speed    4
shield       5
Name: viper, dtype: int64
```

Selection

- The process of accessing a subset of a dataframe. You can select subsets using `loc` and `iloc`.

```
data = {
    "A": [1, 2, 3],
    "B": [4, 5, 6],
    "C": [7, 8, 9]
}

df = pd.DataFrame(data)
df.loc[0:1, ["A", "C"]]
```

Visual representation of the selection process:

	A	C
0	1	7
1	2	8

Code: `df.iloc[1:2, :]`

	A	B	C
1	2	5	8

Filtering

- Selecting values of a dataset where certain conditions are true

- `df[condition]`

Filtering

Selecting values of a dataset where certain conditions are true.

[Check out this article!](#)

Popular Pattern:

`df[condition]`

```
data = {
  "A": [1, 2, 3],
  "B": [4, 5, 6],
  "C": [7, 8, 9]
}

df = pd.DataFrame(data)

evens = df[df.iloc[:, 1] % 2 == 0]
evens
```

	A	B	C
0	NaN	4.0	NaN
1	2.0	NaN	8.0
2	NaN	6.0	NaN

Combining Data Frames

- Three techniques
 - Concatenate: naively combines along an axis
 - Merge: Combine through shared column
 - Join: Combine using shared indices

