PANDAS
Cheat Sheet

1. Basic Commands

Pandas is a software library for Python that provides tools for data manipulation and analysis. It's important to ensure that the correct version of pandas is installed for compatibility with your code.

- Importing Pandas:

```python
import pandas as pd
```

- Checking Pandas Version:

```python
print(pd.__version__)
```

2. Dataframe Creation

Dataframes are two-dimensional labeled data structures with columns potentially of different types.

You can think of it like a spreadsheet or SQL table.

- From a list:

```python
my_list = [1, 2, 3, 4, 5]
df = pd.DataFrame(my_list, columns=['column_name'])
```
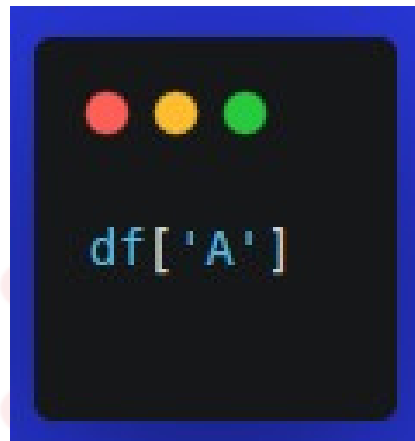
- From a Dictionary:

```python
my_dict = {'A': [1, 2, 3],'B': [4, 5, 6]}
df = pd.DataFrame(my_dict)
```
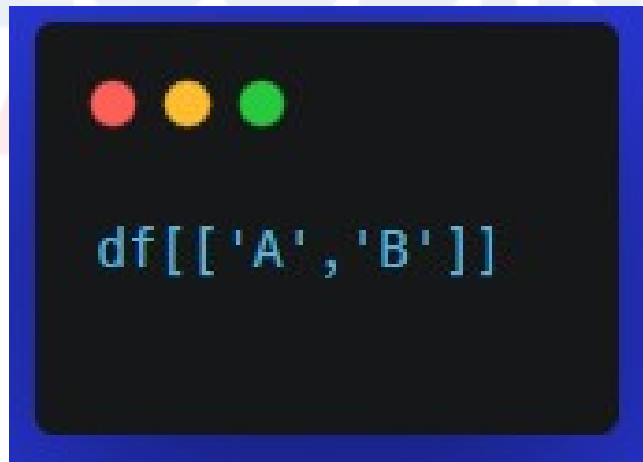
3. Data Selection

- **Selecting a column:**

```
df['A']
```

- **Selecting multiple columns:**

```
df[['A','B']]
```

Pandas provides different methods for data selection.

- Selecting rows:

```python
df.loc[0] # row label
df.iloc[0] # row index
```

- Selecting specific value:

```python
df.at[0,'A'] # row label and column name df.
iat[0, 0]# row index and column index
```

4. Data Manipulation

Pandas provide various ways to manipulate a dataset.

- Adding a column:

```python
df['C'] = pd.Series([7, 8, 9])
```

- Deleting a column:

```python
df.drop('C', axis=1, inplace=True)
```

- Renaming columns:

```python
df.rename(columns={'A': 'new_A'}, inplace=True)
```
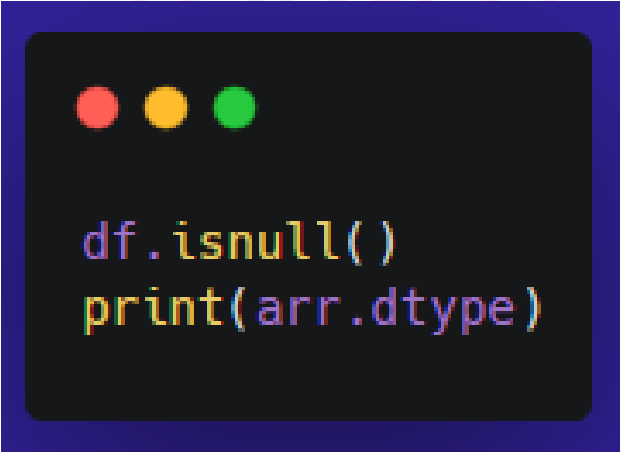
- Applying a function to a column:

```python
df['A'].apply(lambda x: x*2)
```

5. Data Cleaning

Data cleaning is detecting and correcting (or removing) corrupt or inaccurate records from a dataset.
- Checking for null values:

```
df.isnull()
print(arr.dtype)
```

- Dropping null values:

```
df.dropna(inplace=True)
```

Filling null values:

```
df.fillna(value=0, inplace=True)
```

- Replacing values:

```
df.replace(1, 10, inplace=True)
```

6. Grouping & Aggregation

Grouping involves combining data based on some criteria, while aggregation is the process of turning the results of a query into a single row.

- Group by:

```python
df.groupby('A')
```

- Aggregation:

```python
df.agg({'A': ['min', 'max', 'mean', 'sum']})
```

7. Merging, Joining, and Concatenating

Pandas provides various ways to combine DataFrames including merge and join.

- Concatenating:

```python
df1 = pd.DataFrame({'A': [1, 2, 3], 'B': [4, 5, 6]})
df2 = pd.DataFrame({'A': [7, 8, 9], 'B': [10, 11, 12]})
df = pd.concat([df1, df2])
```

- Merging:

```python
df1 = pd.DataFrame({'A': [1, 2, 3], 'B': [4, 5, 6]})
df2 = pd.DataFrame({'A': [1, 2, 3], 'C': [7, 8, 9]})
df = pd.merge(df1, df2, on='A')
```

- Joining:

```python
df1 = pd.DataFrame({'A': [1, 2, 3], 'B': [4, 5, 6]})
df2 = pd.DataFrame({'C': [7, 8, 9]})
df = df1.join(df2)
```

8. Working with Dates

Pandas provides powerful functionalities for working with dates.

- Convert to datetime:

```python
df['date'] = pd.to_datetime(df['date'])
```

- Extracting date parts:

```python
df['year'] = df['date'].dt.year
df['month'] = df['date'].dt.month
df['day'] = df['date'].dt.day
```

9. File I/O

Pandas can seamlessly read from and write to a variety of file formats.

- Reading a CSV file:

```
df = pd.read_csv('file.csv')
```

- Writing to a CSV file:

```
df.to_csv('file.csv', index=False)
```

- Similarly for other file formats like

```
Excel (read_excel, to_excel), JSON (read_json, to_json), SQL (read_sql, to_sql), etc.
```

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