PANDAS BASICS
PANEL DATA

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pandas Basics

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```python
1  #%pip install pandas --upgrade
2  #%pip install matplotlib --upgrade
```

```python
1  import pandas as pd
2  import numpy as np
3  import matplotlib.pyplot as plt
```

DataFrame

```python
1  # Creating dictionary
2  data = {
3      "Name":['Henry','Owen','Ada'],
4      "Age":[22,35,58],
5      "Sex":['M','M','F']
6  }
```

```python
1  # Creating DataFrame from dictionary
2  df = pd.DataFrame(data)
3  df
```
⊞ Open 'df' in Data Wrangler

Series

```python
1  df['Name']
```

```python
1  df['Age']
```

```python
1  df['Sex']
```

Descriptive Statistics

```python
1  # Voltage response data
2  voltage = np.array([
3      [1,2,3,4,5,6,7,8],
4      [12,5,9.1,3.3,24,18.5,15.2,np.nan],
5      [2.8,4.5,6,9,11.7,14.8,17.3,20]
6  ])
7  voltage = voltage.T
```

```python
1  # Creating DataFrame from numpy array
2  df = pd.DataFrame(voltage,columns=['Measurement_No','Instrument_A','Instrument_B'])
3  df
```
⊞ Open 'df' in Data Wrangler

```python
1  # Descriptive Statistics
2  df.describe()
```

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Bar Chart

```python
# Mean of instrument A
a_mean = df['Instrument_A'].mean()
a_mean
```
Python

```python
# Mean of instrument B
b_mean = df['Instrument_B'].mean()
b_mean
```
Python

```python
# Bar Chart
plt.figure()
plt.bar(['A','B'],[a_mean,b_mean])
plt.title('Average Voltage by Instrument')
plt.ylabel('Voltage (V)')
plt.show()
```
Python

csv to DataFrame

```python
# Creating DataFrame from csv file
df = pd.read_csv(r"raw\resistance-data.csv",
                 delimiter=",")
# Display infromation
df.info()
```
Python

```python
# Display top 5 rows
df.head()
```
Open 'df' in Data Wrangler
Python

```python
# Display last 5 rows
df.tail()
```
Open 'df' in Data Wrangler
Python

```python
# Descriptive statistics
df.describe()
```
Python

```python
# Filtering DataFrame where machine is Jaguar
jag = df[df['Machine'] == 'Jaguar']
jag
```
Open 'jag' in Data Wrangler
Python

```python
# Mean of Jaguar machine
jag['Resistance'].mean()
```
Python

```python
# Filtering DataFrame where machine is Panther
pan = df[df['Machine']=='Panther']
pan
```
Open 'pan' in Data Wrangler
Python

```python
# Mean of Panther machine
pan['Resistance'].mean()
```
Python

Bar Chart

```python
# Creating new DataFrame for the mean
df_w = df.groupby('Machine').mean().reset_index()
df_w
```
Open 'df_w' in Data Wrangler
Python

```python
# Bar Chart
plt.figure()
plt.bar(df_w['Machine'],df_w['Resistance'])
plt.title('Average Resistance by Machine')
plt.ylabel('Resistance (ohms)')
plt.show()

```
Python