

Pandas Operations Explained

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EDS Make Up Session Assignment :

DataFrame

Data Structures in Pandas

Series

A one-dimensional labeled array.

```
import pandas as pd  
s = pd.Series([10, 20, 30])
```

DataFrame

A 2D labeled data structure with columns.

```
df = pd.DataFrame({'Name': ['Alice', 'Bob'], 'Age': [25, 30]})
```

Data Selection and Indexing



.loc[] – label-based selection



.iloc[] – index-based selection

Selecting columns and rows

```
df.loc[0]
```

```
df.iloc[1]
```

```
df['Name']          # Column  
df[0:2]            # Rows
```

Data Cleaning

.isnull() and .dropna()

Methods to identify and remove missing values from your dataset

.fillna() – replace missing values

Replace missing values with specified values or methods

```
df.isnull()
```

```
df.dropna()
```

```
df.fillna(0)
```

Data Manipulation



.rename() – rename columns

Change column names for better readability

```
df.rename(columns={'Name': 'FullName'})
```



.astype() – change data type

Convert columns to appropriate data types

```
df['Age'].astype(float)
```

Data Aggregation



.groupby() + aggregation

Group data and apply statistical operations

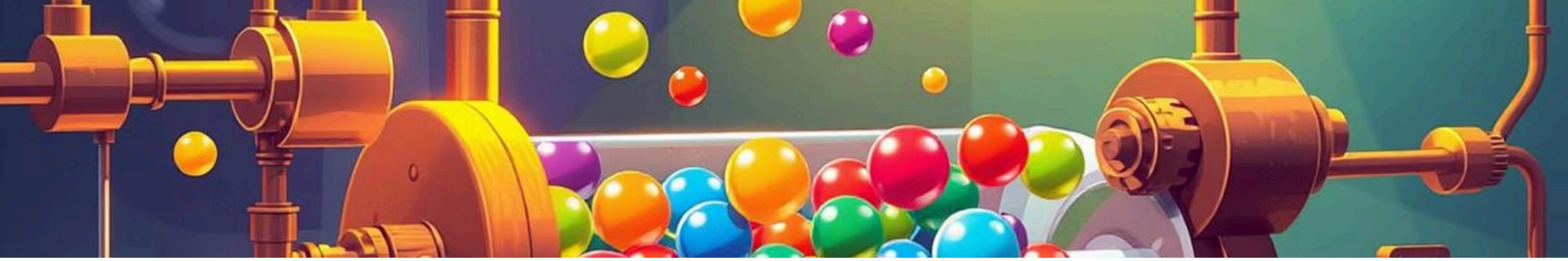


.agg() – multiple functions

Apply multiple aggregation functions at once

```
df.groupby('Name')['Age'].mean()
```

```
df.agg({'Age': ['min', 'max']})
```



Sorting and Filtering

`.sort_values()`

Arrange data in ascending or descending order

Filtering with conditions

Select data that meets specific criteria

```
df.sort_values('Age')
```

```
df[df['Age'] > 25]
```

Merging and Joining

`pd.merge()`

Combine datasets based on common columns or indices, similar to SQL joins

```
pd.merge(df1, df2, on='id')
```

```
pd.concat([df1, df2])
```

`pd.concat()` – stacking vertically or horizontally

Combine datasets by appending rows or columns



Reading and Writing Files

1

Reading CSV

Import data from CSV files into pandas DataFrames

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

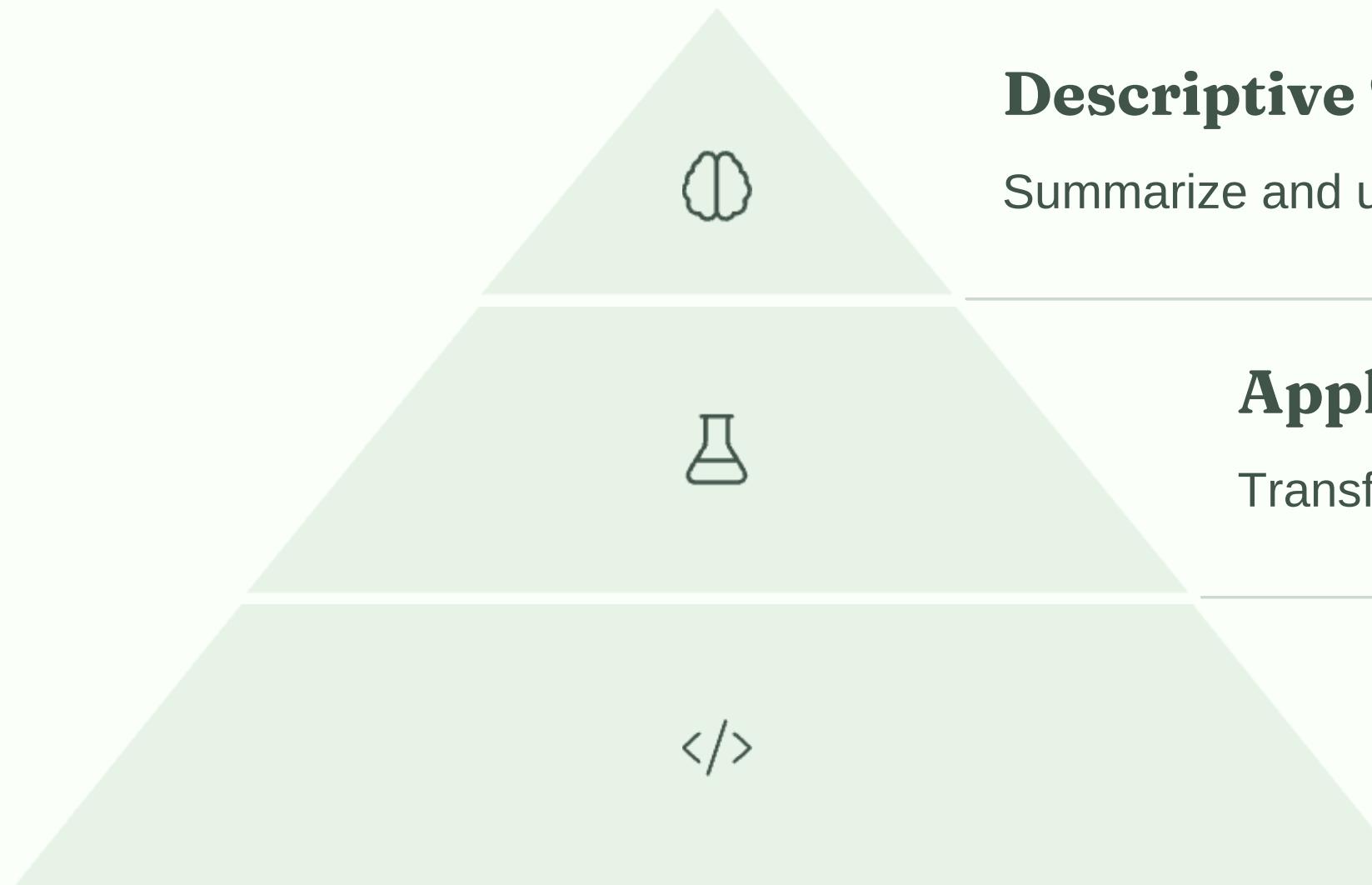
2

Writing CSV

Export pandas DataFrames to CSV files

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

Descriptive Statistics and Applying Functions



Descriptive Statistics

Summarize and understand your data

Applying Functions

Transform data with custom operations

.apply()

Apply functions to rows or columns