

Pandas - Creating DataFrames

Creating DataFrames from Dictionaries

```
import pandas as pd
import numpy as np

# From dictionary
data = {
    'Name': ['Alice', 'Bob', 'Charlie', 'David'],
    'Age': [25, 30, 35, 28],
    'Score': [85, 92, 78, 88]
}

df = pd.DataFrame(data)
print(df)
print(f"\nShape: {df.shape}")
print(f"Columns: {list(df.columns)}")
```

Creating DataFrames from NumPy Arrays

```
# From NumPy array with column names
arr = np.array([[1, 2, 3],
                [4, 5, 6],
                [7, 8, 9]])

df = pd.DataFrame(arr, columns=['A', 'B', 'C'])
print("From array:")
print(df)

# With index labels
df_indexed = pd.DataFrame(arr,
                           columns=['X', 'Y', 'Z'],
                           index=['row1', 'row2', 'row3'])
print("\nWith custom index:")
print(df_indexed)
```

Creating DataFrames from Lists

```
# From list of lists
data = [
    ['Alice', 25, 85],
    ['Bob', 30, 92],
    ['Charlie', 35, 78]
]

df = pd.DataFrame(data, columns=['Name', 'Age', 'Score'])
print(df)

# From list of dictionaries
records = [
    {'Name': 'Alice', 'Age': 25, 'City': 'NYC'},
    {'Name': 'Bob', 'Age': 30, 'City': 'LA'},
    {'Name': 'Charlie', 'Age': 35, 'City': 'Chicago'}
]

df_records = pd.DataFrame(records)
print("\nFrom records:")
print(df_records)
```

Creating DataFrames with Date Index

```
# Create date range
dates = pd.date_range('2024-01-01', periods=10, freq='D')
df = pd.DataFrame({
    'Temperature': np.random.randint(60, 90, 10),
    'Humidity': np.random.randint(30, 70, 10)
}, index=dates)

print(df)
print(f"\nDate range: {df.index.min()} to {df.index.max()}"")
```

Advanced DataFrame Creation

```
# Create with MultiIndex
arrays = [
    ['A', 'A', 'B', 'B'],
    [1, 2, 1, 2]
]
index = pd.MultiIndex.from_arrays(arrays, names=['Letter', 'Number'])
df_multi = pd.DataFrame({
    'Value1': np.random.randn(4),
    'Value2': np.random.randn(4)
}, index=index)

print("MultiIndex DataFrame:")
print(df_multi)

# Create from Series
s1 = pd.Series([1, 2, 3], name='A')
s2 = pd.Series([4, 5, 6], name='B')
df_from_series = pd.concat([s1, s2], axis=1)
print("\nFrom Series:")
print(df_from_series)
```