

**Ex.No.6****Data Wrangling****Aim:**

To do Data Wrangling functions

**Description:**

Data wrangling is the task in data science and analysis which includes operations

like: Data Sorting: To rearrange values in ascending or descending order.

Data Filtration: To create a subset of available data.

Data Reduction: To eliminate or replace unwanted values.

Data Access: To read or write data files.

Data Processing: To perform aggregation, statistical, and similar operations on specific values.

1. Using join function to join two DataFrames.
2. Using combine function to combine two DataFrames.
3. Using merge function to merge two DataFrames.
4. Using replace function to replace the NaN values by average value.
5. Filtering and dropping the rows and rows and columns respectively.
6. Using concat function to concatenate two DataFrames.
7. Using melt function to reshape the DataFrame dimension.
8. Using groupby function to group the data set.
9. Using duplicated function to remove duplicated rows in the DataFrame
10. Using merge function to merge two DataFrame data sets.

**PROGRAM:**

```
import pandas as pd
```

```
data1 = {'Name': ['Jai', 'Princi', 'Gaurav',  
'Anuj', 'Ravi', 'Natasha', 'Tom', 'Rovana', 'Riya'],  
'Roll No': [4,8,2,1,9,7,14,11,10],  
'Age': [17, 17, 18, 17, 18, 17,19,16, 17],  
'Gender': ['M', 'F', 'M', 'M', 'M', 'F','F','M', 'F']}
```

```
data2 = {'Name': ['Kelly', 'Natasha', 'Jack', 'Stacy',  
'Stark', 'Loki', 'Rovana', 'Tom'],  
'Roll No': [5,7,3,12,13,6,11,14],  
'Age': [19, 17,16, 20, 17, 18, 16, 19],  
'Gender': ['F','F','M', 'F', 'M', 'M', 'F', 'M'],  
'Marks': [95,71, 76, 94, 'NaN', 80,83, 68]}
```

```
marks = {'Marks': [80, 76, 'NaN', 74, 66,71,68,83, 'NaN']}
```

```
df1= pd.DataFrame(data1)
```

```
df2= pd.DataFrame(data2)
```

```
marks = pd.DataFrame(marks)
```

```
print("\nOriginal DataFrame 1:\n",df1)
```

```
print("\nOriginal DataFrame 2:\n",df1)
```

```
print("\nMarks:\n",marks)
```

---

```
df1 = df1.join(marks) print("\nDataFrame  
1:\n",df1)
```

---

```
# Compute average c
```

```
= avg = 0
```

```
for ele in df1['Marks']: if
```

```
    str(ele).isnumeric():
```

```
        c += 1
```

```
        avg += ele
```

```
avg/= c
```

```
# Replace missing values
```

```
df1 = df1.replace(to_replace="NaN",value=avg) df2 =
```

```
df2.replace(to_replace="NaN",value=avg) # Display
```

```
data
```

```
print("\nReplacing NaN with Average marks:\nData Frame 1\n",df1)
```

```
print("\n\nData Frame 2\n",df2)
```

---

```
def myfunc(a, b):
```

```
    return a if a > b else b
```

```
df_combined = df1['Marks'].combine(df2['Marks'], myfunc)
```

```
# Print the result
```

```
print("\nCombining the above two DataFrames using combine function with some condition:\n", df_combined)
```

---

```
newdf = df1.merge(df2, how='right')
```

```
print("\nMerge operation:\n",newdf)
```

---

```
df3 = pd.concat([df1,df2])
```

```
print("\nConcatenated DataFrame using concat function:\n",df3)
```

---

```
# Group the data
```

```
grouped = df3.groupby('Age')
```

```
print("\nGroup by age 17:\n",grouped.get_group(17))
```

---

```
print("\nOriginal DataFrame:\n",df3)
```

```
#reshape DataFrame from wide format to long format
```

```
df = pd.melt(df3, id_vars='Roll No', value_vars=['Gender', 'Marks']) #view
```

```
updated DataFrame
```

```
print("\nReshaped Data Frame:\n",df)
```

---

```
# Filter top scoring students
```

```
df3=df3[df3['Marks'] >= 75] print("\nAfter
```

```
Filtering function:\n",df3) # Remove age
```

```
row
```

```
df3 = df3.drop(['Age'],axis=1)
```

```
# Display data
```

```
print("\nAfter Dropping function:\n",df3)
```

---

```

print("\nOriginal DataFrame:\n",df3)
# Here df.duplicated() list duplicate Entries in Rollno.
# So that ~(NOT) is placed in order to get non duplicate values. non_duplicate
=df3[~df3.duplicated('Roll No')]
#printing non-duplicate values
print("\nRemoved duplicated rows:\n",non_duplicate)

```

---

#### OUTPUT:

##### Original DataFrame 1:

|   | Name    | Roll No | Age | Gender |
|---|---------|---------|-----|--------|
| 0 | Jai     | 4       | 17  | M      |
| 1 | Princi  | 8       | 17  | F      |
| 2 | Gaurav  | 2       | 18  | M      |
| 3 | Anuj    | 1       | 17  | M      |
| 4 | Ravi    | 9       | 18  | M      |
| 5 | Natasha | 7       | 17  | F      |
| 6 | Tom     | 14      | 19  | F      |
| 7 | Rovana  | 11      | 16  | M      |
| 8 | Riya    | 10      | 17  | F      |

##### Original DataFrame 2:

|   | Name    | Roll No | Age | Gender | Marks |
|---|---------|---------|-----|--------|-------|
| 0 | Kelly   | 5       | 19  | F      | 95    |
| 1 | Natasha | 7       | 17  | F      | 71    |
| 2 | Jack    | 3       | 16  | M      | 76    |
| 3 | Stacy   | 12      | 20  | F      | 94    |
| 4 | Stark   | 13      | 17  | M      | NaN   |
| 5 | Loki    | 6       | 18  | M      | 80    |
| 6 | Rovana  | 11      | 16  | F      | 83    |
| 7 | Tom     | 14      | 19  | M      | 68    |

##### Marks:

|   | Marks |
|---|-------|
| 0 | 80    |
| 1 | 76    |
| 2 | NaN   |
| 3 | 74    |
| 4 | 66    |
| 5 | 71    |
| 6 | 68    |
| 7 | 83    |
| 8 | NaN   |

DataFrame 1:

|   | Name    | Roll No | Age | Gender | Marks |     |
|---|---------|---------|-----|--------|-------|-----|
| 0 | Jai     |         | 4   | 17     | M     | 80  |
| 1 | Princi  |         | 8   | 17     | F     | 76  |
| 2 | Gaurav  |         | 2   | 18     | M     | NaN |
| 3 | Anuj    |         | 1   | 17     | M     | 74  |
| 4 | Ravi    |         | 9   | 18     | M     | 66  |
| 5 | Natasha |         | 7   | 17     | F     | 71  |
| 6 | Tom     |         | 14  | 19     | F     | 68  |
| 7 | Rovana  |         | 11  | 16     | M     | 83  |
| 8 | Riya    |         | 10  | 17     | F     | NaN |

Replacing NaN with Average marks:

Data Frame 1

|   | Name    | Roll No | Age | Gender | Marks |      |
|---|---------|---------|-----|--------|-------|------|
| 0 | Jai     |         | 4   | 17     | M     | 80.0 |
| 1 | Princi  |         | 8   | 17     | F     | 76.0 |
| 2 | Gaurav  |         | 2   | 18     | M     | 74.0 |
| 3 | Anuj    |         | 1   | 17     | M     | 74.0 |
| 4 | Ravi    |         | 9   | 18     | M     | 66.0 |
| 5 | Natasha |         | 7   | 17     | F     | 71.0 |
| 6 | Tom     |         | 14  | 19     | F     | 68.0 |
| 7 | Rovana  |         | 11  | 16     | M     | 83.0 |
| 8 | Riya    |         | 10  | 17     | F     | 74.0 |

Data Frame 2

|   | Name    | Roll No | Age | Gender | Marks |      |
|---|---------|---------|-----|--------|-------|------|
| 0 | Kelly   |         | 5   | 19     | F     | 95.0 |
| 1 | Natasha |         | 7   | 17     | F     | 71.0 |
| 2 | Jack    |         | 3   | 16     | M     | 76.0 |
| 3 | Stacy   |         | 12  | 20     | F     | 94.0 |
| 4 | Stark   |         | 13  | 17     | M     | 74.0 |
| 5 | Loki    |         | 6   | 18     | M     | 80.0 |
| 6 | Rovana  |         | 11  | 16     | F     | 83.0 |
| 7 | Tom     |         | 14  | 19     | M     | 68.0 |

Combining the above two DataFrames using combine function with some condition:

|   |      |
|---|------|
| 0 | 95.0 |
| 1 | 76.0 |
| 2 | 76.0 |
| 3 | 94.0 |
| 4 | 74.0 |
| 5 | 80.0 |
| 6 | 83.0 |
| 7 | 83.0 |
| 8 | NaN  |

Name: Marks, dtype: float64

Merge operation:

|   | Name    | Roll No | Age | Gender | Marks |      |
|---|---------|---------|-----|--------|-------|------|
| 0 | Kelly   |         | 5   | 19     | F     | 95.0 |
| 1 | Natasha |         | 7   | 17     | F     | 71.0 |
| 2 | Jack    |         | 3   | 16     | M     | 76.0 |
| 3 | Stacy   |         | 12  | 20     | F     | 94.0 |
| 4 | Stark   |         | 13  | 17     | M     | 74.0 |
| 5 | Loki    |         | 6   | 18     | M     | 80.0 |
| 6 | Rovana  |         | 11  | 16     | F     | 83.0 |
| 7 | Tom     |         | 14  | 19     | M     | 68.0 |

Concatenated DataFrame using concat function:

|   |         |    |    |   |      |
|---|---------|----|----|---|------|
| 0 | Jai     | 4  | 17 | M | 80.0 |
| 1 | Princi  | 8  | 17 | F | 76.0 |
| 2 | Gaurav  | 2  | 18 | M | 74.0 |
| 3 | Anuj    | 1  | 17 | M | 74.0 |
| 4 | Ravi    | 9  | 18 | M | 66.0 |
| 5 | Natasha | 7  | 17 | F | 71.0 |
| 6 | Tom     | 14 | 19 | F | 68.0 |
| 7 | Rovana  | 11 | 16 | M | 83.0 |
| 8 | Riya    | 10 | 17 | F | 74.0 |
| 0 | Kelly   | 5  | 19 | F | 95.0 |
| 1 | Natasha | 7  | 17 | F | 71.0 |
| 2 | Jack    | 3  | 16 | M | 76.0 |
| 3 | Stacy   | 12 | 20 | F | 94.0 |
| 4 | Stark   | 13 | 17 | M | 74.0 |
| 5 | Loki    | 6  | 18 | M | 80.0 |
| 6 | Rovana  | 11 | 16 | F | 83.0 |
| 7 | Tom     | 14 | 19 | M | 68.0 |

| Group by age |         | 17:  |    |     |        |       |
|--------------|---------|------|----|-----|--------|-------|
|              | Name    | Roll | No | Age | Gender | Marks |
| 0            | Jai     |      | 4  | 17  | M      | 80.0  |
| 1            | Princi  |      | 8  | 17  | F      | 76.0  |
| 3            | Anuj    |      | 1  | 17  | M      | 74.0  |
| 5            | Natasha |      | 7  | 17  | F      | 71.0  |
| 8            | Riya    |      | 10 | 17  | F      | 74.0  |
| 1            | Natasha |      | 7  | 17  | F      | 71.0  |
| 4            | Stark   |      | 13 | 17  | M      | 74.0  |

Original DataFrame:

|   | Name    | Roll No | Age | Gender | Marks |
|---|---------|---------|-----|--------|-------|
| 0 | Jai     |         | 4   | 17     | M     |
| 1 | Princi  |         | 8   | 17     | F     |
| 2 | Gaurav  |         | 2   | 18     | M     |
| 3 | Anuj    |         | 1   | 17     | M     |
| 4 | Ravi    |         | 9   | 18     | M     |
| 5 | Natasha |         | 7   | 17     | F     |
| 6 | Tom     |         | 14  | 19     | F     |
| 7 | Rovana  |         | 11  | 16     | M     |
| 8 | Riya    |         | 10  | 17     | F     |
| 0 | Kelly   |         | 5   | 19     | F     |
| 1 | Natasha |         | 7   | 17     | F     |
| 2 | Jack    |         | 3   | 16     | M     |
| 3 | Stacy   |         | 12  | 20     | F     |
| 4 | Stark   |         | 13  | 17     | M     |
| 5 | Loki    |         | 6   | 18     | M     |
| 6 | Rovana  |         | 11  | 16     | F     |
| 7 | Tom     |         | 14  | 19     | M     |

Reshaped Data Frame:

|    | Roll No | variable | value |
|----|---------|----------|-------|
| 0  | 4       | Gender   | M     |
| 1  | 8       | Gender   | F     |
| 2  | 2       | Gender   | M     |
| 3  | 1       | Gender   | M     |
| 4  | 9       | Gender   | M     |
| 5  | 7       | Gender   | F     |
| 6  | 14      | Gender   | F     |
| 7  | 11      | Gender   | M     |
| 8  | 10      | Gender   | F     |
| 9  | 5       | Gender   | F     |
| 10 | 7       | Gender   | F     |
| 11 | 3       | Gender   | M     |
| 12 | 12      | Gender   | F     |
| 13 | 13      | Gender   | M     |
| 14 | 6       | Gender   | M     |
| 15 | 11      | Gender   | F     |
| 16 | 14      | Gender   | M     |
| 17 | 4       | Marks    | 80.0  |
| 18 | 8       | Marks    | 76.0  |
| 19 | 2       | Marks    | 74.0  |
| 20 | 1       | Marks    | 74.0  |
| 21 | 9       | Marks    | 66.0  |
| 22 | 7       | Marks    | 71.0  |
| 23 | 14      | Marks    | 68.0  |
| 24 | 11      | Marks    | 83.0  |
| 25 | 10      | Marks    | 74.0  |
| 26 | 5       | Marks    | 95.0  |
| 27 | 7       | Marks    | 71.0  |
| 28 | 3       | Marks    | 76.0  |
| 29 | 12      | Marks    | 94.0  |
| 30 | 13      | Marks    | 74.0  |
| 31 | 6       | Marks    | 80.0  |
| 32 | 11      | Marks    | 83.0  |
| 33 | 14      | Marks    | 68.0  |

After Filtering function:

|   | Name   | Roll No | Age | Gender | Marks |
|---|--------|---------|-----|--------|-------|
| 0 | Jai    | 4       | 17  | M      | 80.0  |
| 1 | Princi | 8       | 17  | F      | 76.0  |
| 7 | Rovana | 11      | 16  | M      | 83.0  |
| 0 | Kelly  | 5       | 19  | F      | 95.0  |
| 2 | Jack   | 3       | 16  | M      | 76.0  |
| 3 | Stacy  | 12      | 20  | F      | 94.0  |
| 5 | Loki   | 6       | 18  | M      | 80.0  |
| 6 | Rovana | 11      | 16  | F      | 83.0  |

After Dropping function:

|   | Name   | Roll No | Gender | Marks |
|---|--------|---------|--------|-------|
| 0 | Jai    | 4       | M      | 80.0  |
| 1 | Princi | 8       | F      | 76.0  |
| 7 | Rovana | 11      | M      | 83.0  |
| 0 | Kelly  | 5       | F      | 95.0  |
| 2 | Jack   | 3       | M      | 76.0  |
| 3 | Stacy  | 12      | F      | 94.0  |
| 5 | Loki   | 6       | M      | 80.0  |
| 6 | Rovana | 11      | F      | 83.0  |

Original DataFrame:

|   | Name   | Roll No | Gender | Marks |
|---|--------|---------|--------|-------|
| 0 | Jai    | 4       | M      | 80.0  |
| 1 | Princi | 8       | F      | 76.0  |
| 7 | Rovana | 11      | M      | 83.0  |
| 0 | Kelly  | 5       | F      | 95.0  |
| 2 | Jack   | 3       | M      | 76.0  |
| 3 | Stacy  | 12      | F      | 94.0  |
| 5 | Loki   | 6       | M      | 80.0  |
| 6 | Rovana | 11      | F      | 83.0  |

Removed duplicated rows:

|   | Name   | Roll No | Gender | Marks |
|---|--------|---------|--------|-------|
| 0 | Jai    | 4       | M      | 80.0  |
| 1 | Princi | 8       | F      | 76.0  |
| 7 | Rovana | 11      | M      | 83.0  |
| 0 | Kelly  | 5       | F      | 95.0  |
| 2 | Jack   | 3       | M      | 76.0  |
| 3 | Stacy  | 12      | F      | 94.0  |
| 5 | Loki   | 6       | M      | 80.0  |

**Result:**

The programs were run successfully