

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

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: 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
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