```
>>> import pandas as pd
>>> data = {'Name': ['Jai', 'Princi', 'Gaurav',
... 'Anuj', 'Ravi', 'Natasha', 'Riya'],
... 'Age': [17, 17, 18, 17, 18, 17, 17],
... 'Gender': ['M', 'F', 'M', 'M', 'M', 'F', 'F'],
... 'Marks': [90, 76, 'NaN', 74, 65, 'NaN', 71]}
>>> df = pd.DataFrame(data)
>>> df
      Name  Age Gender Marks
0      Jai   17      M    90
1   Princi   17      F    76
2   Gaurav   18      M   NaN
3     Anuj   17      M    74
4     Ravi   18      M    65
5  Natasha   17      F   NaN
6     Riya   17      F    71
>>>
```

```
>>> c = avg = 0
>>> for ele in df['Marks']:
...     if str(ele).isnumeric():
...         c+=1
...         avg+=ele
...
>>> avg/=c
>>> df = df.replace(to_replace="NaN",value=avg)
>>> df
      Name  Age Gender  Marks
0      Jai   17      M   90.0
1   Princi   17      F   76.0
2   Gaurav   18      M   75.2
3     Anuj   17      M   74.0
4     Ravi   18      M   65.0
5  Natasha   17      F   75.2
6     Riya   17      F   71.0
```

```
>>> df['Gender'] = df['Gender'].map({'M': 0,'F': 1, }).astype(float)
>>> df
      Name  Age  Gender  Marks
0      Jai   17     0.0   90.0
1   Princi   17     1.0   76.0
2   Gaurav   18     0.0   75.2
3     Anuj   17     0.0   74.0
4     Ravi   18     0.0   65.0
5  Natasha   17     1.0   75.2
6     Riya   17     1.0   71.0
>>> df = df[df['Marks'] >= 70].copy()
>>> df
      Name  Age  Gender  Marks
0      Jai   17     0.0   90.0
1   Princi   17     1.0   76.0
2   Gaurav   18     0.0   75.2
3     Anuj   17     0.0   74.0
5  Natasha   17     1.0   75.2
6     Riya   17     1.0   71.0
```

```
>>> import pandas as pd
>>> details = pd.DataFrame({
... 'ID': [101, 102, 103, 104, 105, 106,
... 107, 108, 109, 110],
... 'NAME': ['Jagroop', 'Praveen', 'Harjot',
... 'Pooja', 'Rahul', 'Nikita',
... 'Saurabh', 'Ayush', 'Dolly', "Mohit"],
... 'BRANCH': ['CSE', 'CSE', 'CSE', 'CSE', 'CSE',
... 'CSE', 'CSE', 'CSE', 'CSE', 'CSE']})
>>> print(details)
    ID     NAME BRANCH
0  101  Jagroop    CSE
1  102  Praveen    CSE
2  103   Harjot    CSE
3  104    Pooja    CSE
4  105    Rahul    CSE
5  106   Nikita    CSE
6  107  Saurabh    CSE
7  108    Ayush    CSE
8  109    Dolly    CSE
9  110    Mohit    CSE
```

```
>>> import pandas as pd
>>> fees_status = pd.DataFrame(
... {'ID': [101, 102, 103, 104, 105,
... 106, 107, 108, 109, 110],
... 'PENDING': ['5000', '250', 'NIL',
... '9000', '15000', 'NIL',
... '4500', '1800', '250', 'NIL']})
>>> print(fees_status)
    ID PENDING
0  101    5000
1  102     250
2  103     NIL
3  104    9000
4  105   15000
5  106     NIL
6  107    4500
7  108    1800
8  109     250
9  110     NIL
```

```
>>> import pandas as pd
>>> details = pd.DataFrame({
... 'ID': [101, 102, 103, 104, 105,
... 106, 107, 108, 109, 110],
... 'NAME': ['Jagroop', 'Praveen', 'Harjot',
... 'Pooja', 'Rahul', 'Nikita',
... 'Saurabh', 'Ayush', 'Dolly', "Mohit"],
... 'BRANCH': ['CSE', 'CSE', 'CSE', 'CSE', 'CSE',
... 'CSE', 'CSE', 'CSE', 'CSE', 'CSE']})
>>> fees_status = pd.DataFrame(
... {'ID': [101, 102, 103, 104, 105,
... 106, 107, 108, 109, 110],
... 'PENDING': ['5000', '250', 'NIL',
... '9000', '15000', 'NIL',
... '4500', '1800', '250', 'NIL']})
>>> print(pd.merge(details, fees_status, on='ID'))
    ID     NAME BRANCH PENDING
0  101  Jagroop    CSE    5000
1  102  Praveen    CSE     250
2  103   Harjot    CSE     NIL
3  104    Pooja    CSE    9000
4  105    Rahul    CSE   15000
5  106   Nikita    CSE     NIL
6  107  Saurabh    CSE    4500
7  108    Ayush    CSE    1800
8  109    Dolly    CSE     250
9  110    Mohit    CSE     NIL
```

```
>>> import pandas as pd
>>> car_selling_data = {'Brand': ['Maruti', 'Maruti', 'Maruti',
... 'Maruti', 'Hyundai', 'Hyundai',
... 'Toyota', 'Mahindra', 'Mahindra',
... 'Ford', 'Toyota', 'Ford'],
... 'Year': [2010, 2011, 2009, 2013,
... 2010, 2011, 2011, 2010,
... 2013, 2010, 2010, 2011],
... 'Sold': [6, 7, 9, 8, 3, 5,
... 2, 8, 7, 2, 4, 2]}
>>> df = pd.DataFrame(car_selling_data)
>>> print(df)
        Brand  Year  Sold
0      Maruti  2010     6
1      Maruti  2011     7
2      Maruti  2009     9
3      Maruti  2013     8
4     Hyundai  2010     3
5     Hyundai  2011     5
6      Toyota  2011     2
7    Mahindra  2010     8
8    Mahindra  2013     7
9        Ford  2010     2
10     Toyota  2010     4
11       Ford  2011     2
```

```
>>> import pandas as pd
>>> car_selling_data = {'Brand': ['Maruti', 'Maruti', 'Maruti',
... 'Maruti', 'Hyundai', 'Hyundai',
... 'Toyota', 'Mahindra', 'Mahindra',
... 'Ford', 'Toyota', 'Ford'],
... 'Year': [2010, 2011, 2009, 2013,
... 2010, 2011, 2011, 2010,
... 2013, 2010, 2010, 2011],
... 'Sold': [6, 7, 9, 8, 3, 5,
... 2, 8, 7, 2, 4, 2]}
>>> df = pd.DataFrame(car_selling_data)
>>> grouped = df.groupby('Year')
>>> print(grouped.get_group(2010))
       Brand  Year  Sold
0      Maruti  2010     6
4     Hyundai  2010     3
7    Mahindra  2010     8
9        Ford  2010     2
10     Toyota  2010     4
```

```
>>> import pandas as pd
>>> student_data = {'Name': ['Amit', 'Praveen', 'Jagroop',
... 'Rahul', 'Vishal', 'Suraj',
... 'Rishab', 'Satyapal', 'Amit',
... 'Rahul', 'Praveen', 'Amit'],
... 'Roll_no': [23, 54, 29, 36, 59, 38,
... 12, 45, 34, 36, 54, 23],
... 'Email': ['xxxx@gmail.com', 'xxxxxx@gmail.com',
... 'xxxxxx@gmail.com', 'xx@gmail.com',
... 'xxxx@gmail.com', 'xxxxx@gmail.com',
... 'xxxxx@gmail.com', 'xxxxx@gmail.com',
... 'xxxxx@gmail.com', 'xxxxxx@gmail.com',
... 'xxxxxxxxx@gmail.com', 'xxxxxxxxx@gmail.com']}
>>> df = pd.DataFrame(student_data)
>>> print(df)
        Name  Roll_no                Email
0       Amit       23        xxxx@gmail.com
1    Praveen       54      xxxxxx@gmail.com
2    Jagroop       29      xxxxxx@gmail.com
3      Rahul       36          xx@gmail.com
4     Vishal       59        xxxx@gmail.com
5      Suraj       38       xxxxx@gmail.com
6     Rishab       12       xxxxx@gmail.com
7   Satyapal       45       xxxxx@gmail.com
8       Amit       34       xxxxx@gmail.com
9      Rahul       36      xxxxxx@gmail.com
10   Praveen       54   xxxxxxxxx@gmail.com
11      Amit       23   xxxxxxxxx@gmail.com
```

```
>>> import pandas as pd
>>> student_data = {'Name': ['Amit', 'Praveen', 'Jagroop',
... 'Rahul', 'Vishal', 'Suraj',
... 'Rishab', 'Satyapal', 'Amit',
... 'Rahul', 'Praveen', 'Amit'],
... 'Roll_no': [23, 54, 29, 36, 59, 38,
... 12, 45, 34, 36, 54, 23],
... 'Email': ['xxxx@gmail.com', 'xxxxxx@gmail.com',
... 'xxxxxx@gmail.com', 'xx@gmail.com',
... 'xxxx@gmail.com', 'xxxxx@gmail.com',
... 'xxxxx@gmail.com', 'xxxxx@gmail.com',
... 'xxxxx@gmail.com', 'xxxxxx@gmail.com',
... 'xxxxxxxxx@gmail.com', 'xxxxxxxxx@gmail.com']}
>>> df = pd.DataFrame(student_data)
>>> non_duplicate = df[~df.duplicated('Roll_no')]
>>> print(non_duplicate)
      Name  Roll_no                Email
0     Amit       23      xxxx@gmail.com
1  Praveen       54    xxxxxx@gmail.com
2  Jagroop       29    xxxxxx@gmail.com
3    Rahul       36        xx@gmail.com
4   Vishal       59      xxxx@gmail.com
5    Suraj       38     xxxxx@gmail.com
6   Rishab       12     xxxxx@gmail.com
7 Satyapal       45     xxxxx@gmail.com
8     Amit       34     xxxxx@gmail.com
```

```
>>> import pandas as pd
>>> data1 = {'Name':['Jai', 'Princi', 'Gaurav', 'Anuj'],
... 'Age':[27, 24, 22, 32],
... 'Address':['Nagpur', 'Kanpur', 'Allahabad', 'Kannuaj'],
... 'Qualification':['Msc', 'MA', 'MCA', 'Phd'],
... 'Mobile No': [97, 91, 58, 76]}
>>> data2 = {'Name':['Gaurav', 'Anuj', 'Dhiraj', 'Hitesh'],
... 'Age':[22, 32, 12, 52],
... 'Address':['Allahabad', 'Kannuaj', 'Allahabad', 'Kannuaj'],
... 'Qualification':['MCA', 'Phd', 'Bcom', 'B.hons'],
... 'Salary':[1000, 2000, 3000, 4000]}
>>> df = pd.DataFrame(data1,index=[0, 1, 2, 3])
>>> df1 = pd.DataFrame(data2, index=[2, 3, 6, 7])
>>> res = pd.concat([df, df1])
>>> print(res)
     Name  Age    Address Qualification  Mobile No  Salary
0      Jai   27     Nagpur           Msc       97.0     NaN
1   Princi   24     Kanpur            MA       91.0     NaN
2   Gaurav   22  Allahabad           MCA       58.0     NaN
3     Anuj   32    Kannuaj           Phd       76.0     NaN
2   Gaurav   22  Allahabad           MCA        NaN  1000.0
3     Anuj   32    Kannuaj           Phd        NaN  2000.0
6   Dhiraj   12  Allahabad          Bcom        NaN  3000.0
7   Hitesh   52    Kannuaj        B.hons        NaN  4000.0
```