1. Basic GroupBy (count, mean, sum , max)

In [21]:
```
import pandas as pd

data = {
    "Name": ["Ramiz", "Aman", "Neha", "Zara", "Karan", "Meera"],
    "Course": ["Python", "AI", "Python", "AI", "Data Science", "Python"],
    "Marks": [88, 76, 95, 92, 85, 90]
}

df = pd.DataFrame(data)


print(df.head())


course_count =df.groupby('Course')['Marks'].count()

print("This is the  Course count:\n", course_count)



marks_ave =df.groupby('Course') ['Marks'].mean()


print("This is the  marks Average \n", marks_ave)




marks_sum =df.groupby('Course') ['Marks'].sum()
print('This is the  marks sum :\n',marks_sum)



marks_max =df.groupby('Course') ['Marks'].max()

print("This is the  marks max : \n", marks_max)
```

```
    Name        Course  Marks
0  Ramiz        Python     88
1   Aman            AI     76
2   Neha        Python     95
3   Zara            AI     92
4  Karan  Data Science     85
This is the  Course count:
 Course
AI              2
Data Science    1
Python          3
Name: Marks, dtype: int64
This is the  marks Average
 Course
AI              84.0
Data Science    85.0
Python          91.0
Name: Marks, dtype: float64
This is the  marks sum :
 Course
AI              168
Data Science     85
Python          273
Name: Marks, dtype: int64
This is the  marks max :
 Course
AI              92
Data Science    85
Python          95
Name: Marks, dtype: int64
```

2. Multiple Aggregations

In [38]:
```
import pandas as pd

data = {
    "Name": ["Ramiz", "Aman", "Neha", "Zara", "Karan", "Meera"],
    "Course": ["Python", "AI", "Python", "AI", "Data Science", "Python"],
    "Marks": [88, 76, 95, 92, 85, 90],
```

```
    "Age": [21, 22, 23, 24, 25, 26]
}
df =pd.DataFrame(data)

print("Show  the Original Data : \n")

print(df.head())


result=df.groupby('Course').agg({

      'Marks':['mean', 'min', 'max'],
      'Age': ['mean', 'count']

})

print("Groupby with Multiple Aggregations:")

print(result)
```

```
Show  the Original Data :

    Name        Course  Marks  Age
0  Ramiz        Python     88   21
1   Aman            AI     76   22
2   Neha        Python     95   23
3   Zara            AI     92   24
4  Karan  Data Science     85   25
Groupby with Multiple Aggregations:
             Marks                Age
              mean min max       mean count
Course
AI            84.0  76  92  23.000000     2
Data Science  85.0  85  85  25.000000     1
Python        91.0  88  95  23.333333     3
```

3. Advanced Groupby ('Multiple Columns)

In [46]:

```
import pandas as pd

data = {
    "Name": ["Ramiz", "Aman", "Neha", "Zara", "Karan", "Meera", "John", "Sara"],
    "Course": ["Python", "AI", "Python", "AI", "Data Science", "Python", "AI", "Data Science"],
    "City": ["Kolkata", "Delhi", "Mumbai", "Delhi", "Kolkata", "Delhi", "Kolkata", "Mumbai"],
    "Marks": [88, 76, 95, 92, 85, 90, 89, 91],
    "Age": [21, 22, 23, 20, 24, 21, 22, 23]
}

df = pd.DataFrame(data)

print("Original DataFrame:")
print(df)

# Group by Course & City → Average Marks and Count of Students
result = df.groupby(["Course", "City"]).agg({
    "Marks": "mean",
    "Name": "count"
})

print("\nAverage Marks and Student Count per Course & City:")
print(result)
```

```
Original DataFrame:
    Name        Course     City  Marks  Age
0  Ramiz        Python  Kolkata     88   21
1   Aman            AI    Delhi     76   22
2   Neha        Python   Mumbai     95   23
3   Zara            AI    Delhi     92   20
4  Karan  Data Science  Kolkata     85   24
5  Meera        Python    Delhi     90   21
6   John            AI  Kolkata     89   22
7   Sara  Data Science   Mumbai     91   23

Average Marks and Student Count per Course & City:
                     Marks  Name
Course       City
AI           Delhi    84.0     2
             Kolkata  89.0     1
Data Science Kolkata  85.0     1
             Mumbai   91.0     1
Python       Delhi    90.0     1
             Kolkata  88.0     1
             Mumbai   95.0     1
```

The compile Project.

In [48]:

```python
#  Importing Required Library
import pandas as pd

#  Unified Data Library
data = {
    "Name": ["Ramiz", "Aman", "Neha", "Zara", "Karan", "Meera", "John", "Sara"],
    "Course": ["Python", "AI", "Python", "AI", "Data Science", "Python", "AI", "Data Science"],
    "City": ["Kolkata", "Delhi", "Mumbai", "Delhi", "Kolkata", "Delhi", "Kolkata", "Mumbai"],
    "Marks": [88, 76, 95, 92, 85, 90, 89, 91],
    "Age": [21, 22, 23, 20, 24, 21, 22, 23]
}

df = pd.DataFrame(data)
print("\n Original Data:")
print(df)

#  1. Basic GroupBy
print("\n 1. Basic GroupBy (Course-wise Stats)")
course_count = df.groupby('Course')['Marks'].count()
marks_avg = df.groupby('Course')['Marks'].mean()
marks_sum = df.groupby('Course')['Marks'].sum()
marks_max = df.groupby('Course')['Marks'].max()

print("Course Count:\n", course_count)
print("Average Marks:\n", marks_avg)
print("Total Marks:\n", marks_sum)
print("Maximum Marks:\n", marks_max)

#  2. Multiple Aggregations
print("\n 2. GroupBy with Multiple Aggregations")
multi_agg = df.groupby('Course').agg({
    'Marks': ['mean', 'min', 'max'],
    'Age': ['mean', 'count']
})
print(multi_agg)

#  3. Advanced GroupBy with Multiple Keys
print("\n 3. Advanced GroupBy (Course & City)")
advanced_agg = df.groupby(['Course', 'City']).agg({
    'Marks': 'mean',
    'Name': 'count'
})
print(advanced_agg)
```

```
 Original Data:
    Name        Course     City  Marks  Age
0  Ramiz        Python  Kolkata     88   21
1   Aman            AI    Delhi     76   22
2   Neha        Python   Mumbai     95   23
3   Zara            AI    Delhi     92   20
4  Karan  Data Science  Kolkata     85   24
5  Meera        Python    Delhi     90   21
6   John            AI  Kolkata     89   22
7   Sara  Data Science   Mumbai     91   23

 1. Basic GroupBy (Course-wise Stats)
Course Count:
 Course
AI              3
Data Science    2
Python          3
Name: Marks, dtype: int64
Average Marks:
 Course
AI              85.666667
Data Science    88.000000
Python          91.000000
Name: Marks, dtype: float64
Total Marks:
 Course
AI              257
Data Science    176
Python          273
Name: Marks, dtype: int64
Maximum Marks:
 Course
AI              92
Data Science    91
Python          95
Name: Marks, dtype: int64

 2. GroupBy with Multiple Aggregations
                 Marks               Age
                  mean min max       mean count
Course
AI            85.666667  76  92  21.333333     3
Data Science  88.000000  85  91  23.500000     2
Python        91.000000  88  95  21.666667     3

 3. Advanced GroupBy (Course & City)
                      Marks  Name
Course       City
AI           Delhi     84.0     2
             Kolkata   89.0     1
Data Science Kolkata   85.0     1
             Mumbai    91.0     1
Python       Delhi     90.0     1
             Kolkata   88.0     1
             Mumbai    95.0     1
```

In [ ]: