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Data Aggregation and Grouping

Aim:

To perform Data Aggregation and Grouping functions

Description:

1. Create a DataFrame
2. Implement Data Aggregation and Grouping functions

Program:

```
import pandas as pd
```

```
import numpy as np
```

```
df = pd.DataFrame({'A' : ['foo', 'foo', 'bar', 'foo', 'bar', 'foo'],  
                  'B' : ['one', 'two', 'three','two', 'two', 'one'],  
                  'C' : np.random.randint(5, size=6),  
                  'D' : np.random.randint(5, size=6),  
                  'E' : np.random.randint(5, size=6)})
```

```
print("\nOriginal DataFrame\n",df)
```

```
#Group by (multi-column): with one column sum
```

```
df1 = df.groupby(['A', 'B'], as_index=False)['C'].sum()
```

```
print("\nOriginal DataFrame\n",df)
```

```
print("\nGroup by (multi-column): with one column sum\n",df1)
```

```
#Group by (multi-column): with multi columns sum
```

```
df2 = df.groupby(['A', 'B'], as_index=False).sum()
```

```
print("\nOriginal DataFrame\n",df)
```

```
print("\nGroup by (multi-column): with multi columns sum\n",df2)
```

```
#Combined Groupby and Aggregate function
```

```
df3 = df.groupby(['A', 'B'], as_index=False)['C'].agg('sum')
```

```
print("\nOriginal DataFrame\n",df)
```

```

print("\nCombined Groupby and Aggregate function\n",df3)

#Combined Groupby and Aggregate function- separate column headings
df4 = (df.groupby(['A', 'B'])
      .agg(['average','mean'),('total','sum'])))
print("\nOriginal DataFrame\n",df)
print("\nCombined Groupby and Aggregate function- separate column headings\n",df4)

df5 = df.groupby(['A', 'B'], as_index=False).sum()
df6 = (df.groupby(['A', 'B']).agg(['sum']))
print("\nOriginal DataFrame\n",df)
print("\nGroupby - sum function\n",df5)
print("\nGroupby and Aggregate - sum function\n",df6)

```

Output:

Original DataFrame

```

   A   B C D E
0 foo one 3 0 3
1 foo two 2 3 0
2 bar three 1 2 1
3 foo two 2 1 4
4 bar two 4 0 3
5 foo one 1 2 3

```

Original DataFrame

```

   A   B C D E
0 foo one 3 0 3
1 foo two 2 3 0
2 bar three 1 2 1
3 foo two 2 1 4
4 bar two 4 0 3

```



```
5 foo one 1 2 3
```

Group by (multi-column): with one column sum

```
  A  B C
0 bar three 1
1 bar two 4
2 foo one 4
3 foo two 4
```

Original DataFrame

```
  A  B C D E
0 foo one 3 0 3
1 foo two 2 3 0
2 bar three 1 2 1
3 foo two 2 1 4
4 bar two 4 0 3
5 foo one 1 2 3
```

Group by (multi-column): with multi columns sum

```
  A  B C D E
0 bar three 1 2 1
1 bar two 4 0 3
2 foo one 4 2 6
3 foo two 4 4 4
```

Original DataFrame

```
  A  B C D E
0 foo one 3 0 3
1 foo two 2 3 0
2 bar three 1 2 1
3 foo two 2 1 4
```

```
4 bar two 4 0 3
```

```
5 foo one 1 2 3
```

Combined Groupby and Aggregate function

```

A  B C
0 bar three 1
1 bar two 4
2 foo one 4
3 foo two 4

```

Original DataFrame

```

A  B C D E
0 foo one 3 0 3
1 foo two 2 3 0
2 bar three 1 2 1
3 foo two 2 1 4
4 bar two 4 0 3
5 foo one 1 2 3

```

Combined Groupby and Aggregate function- separate column headings

```

      C      D      E
      average total average total average total
A  B
bar three  1.0  1    2.0  2    1.0  1
      two  4.0  4    0.0  0    3.0  3
foo one  2.0  4    1.0  2    3.0  6
      two  2.0  4    2.0  4    2.0  4

```

Original DataFrame

```

A  B C D E
0 foo one 3 0 3

```

```
1 foo two 2 3 0
2 bar three 1 2 1
3 foo two 2 1 4
4 bar two 4 0 3
5 foo one 1 2 3
```

Groupby - sum function

```
   A  B C D E
0 bar three 1 2 1
1 bar two 4 0 3
2 foo one 4 2 6
3 foo two 4 4 4
```

Groupby and Aggregate - sum function

```
      C  D  E
sum sum sum
A  B
bar three 1  2  1
      two  4  0  3
foo one  4  2  6
      two  4  4  4
```

Result:

Hence the programs were run successfully.