ASSIGNMENT NO. -4

[75]:
```
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```

[76]:
```
import pandas as pd
```

[77]:
```
df=pd.read_csv("grainsales.csv")
```

[78]:
```
df
```

[78]:
[ ]:

```
      GrainName        State       City Months  Year    Sales
0         Ragi Maharashtra    Nagpur    JAN 2023 1000000
 1      Bajra Panjab      Amritsar    FEB 2023 1500000 2
     Ragi  Maharashtra Nagpur      JAN 2023 1000000 3
Bajra Panjab      Amritsar    FEB 2023 1500000 4    Ragi
        Maharashtra Nagpur      JAN 2023 1000000
5 Bajra  Panjab Amritsar FEB 2023 1500000 6 Oats
Hariyana Gurugram MARCH 2023 2000000
7 Sattu Gujarat Surat APRIL 2023 2500000 8 Sooji
Tamil Nadu Madurai MAY 2023 3000000
   9     Brown rice Telangana Hyderabad   JUNE 2023
3500000 10  Wheat West Bengol     Asansole   JULY 2023
                        4000000
11        Corn    UP    Kanpur     AUG 2023 4500000
12        Ragi Maharashtra  Nagpur     JAN 2023
          1000000
13        Bajra Panjab Amritsar FEB 2023 1500000 14
          Oats Hariyana Gurugram MARCH 2023 2000000
15 Sattu Gujarat Surat APRIL 2023 2500000 16 Sooji
Tamil Nadu Madurai MAY 2023 3500000
   17 Brown rice    Telangana Hyderabad   JUNE 2023
3500000 18  Wheat West Bengol     Asansole   JULY 2023
                        4000000
19        Corn          UP    Kanpur    AUG 2023 4500000
```

[ ]:

1 Q1. Which was the best month for sales? How much was earned that month?

[79]:
```
df1=df.groupby(["Months"]).max("Sales")
df1
```

[79]:

Months	Year	Sales
APRIL	2023	2500000
AUG	2023	4500000
FEB	2023	1500000
JAN	2023	1000000
JULY	2023	4000000
JUNE	2023	3500000
MARCH	2023	2000000
MAY	2023	3500000

[ ]:
```

```

[80]:
```
df1=df.groupby(["Months"])[["Sales"]].sum()
df1
```

[80]:

Months	Sales
APRIL	5000000
AUG	9000000
FEB	6000000
JAN	4000000
JULY	8000000
JUNE	7000000
MARCH	4000000
MAY	6500000

[81]:
```
df1=df.groupby(['Months'],sort =False)[["Sales"]].sum()
max1 = df1["Sales"].max()
df1[df1["Sales"]==max1]
```

[81]:

Months	Sales
AUG	9000000

2 Q2. Which product sold the most? Why do you think it did?

[82]:
```
df2=df.groupby(['GrainName'],sort =False)[["Sales"]].sum()
max1 = df2["Sales"].max()
df2[df2["Sales"]==max1]
```

[82]:

	Sales

```
GrainName
Corn      9000000
```

3 Q3. Which city sold the most products?

[83]:
```
df2=df.groupby(['City'],sort =False)[["Sales"]].sum()
max1 = df2["Sales"].max()
df2[df2["Sales"]==max1]
```

[83]:
```
         Sales
City
Kanpur 9000000
```

4 Q4. What Products are most often sold together?

[84]:
```
import pandas as pd
from itertools import combinations
from collections import Counter
```

[85]:
```
product_combinations = df.groupby('Months')['GrainName'].apply(lambda x:␣
 ↪list(combinations(x, 2))).tolist()
all_combinations = [item for sublist in product_combinations for item in␣
 ↪sublist]
```

[86]:
```
combination_counts = Counter(all_combinations)
sorted_combinations = sorted(combination_counts.items(), key=lambda x: x[1],␣
 ↪reverse=True)
```

[87]:
```
print("Most often sold together products: ")
for combination, count in sorted_combinations:
    print(combination, "-", count)
```

```
Most often sold together products:
('Bajra', 'Bajra') - 6
('Ragi', 'Ragi') - 6
('Sattu ', 'Sattu ') - 1
('Corn', 'Corn') - 1
('Wheat', 'Wheat') - 1
('Brown rice ', 'Brown rice ') - 1
('Oats', 'Oats') - 1
('Sooji', 'Sooji') - 1
```