Name - Ojas Denge
Division - G (4)
Roll No. - 777
PRN No. - 202201070072

EDS PRACTICAL-4

Code:

```
import pandas as pd
import itertools

# Read the CSV file into a DataFrame
df = pd.read_csv('/content/drive/MyDrive/Colab
Notebooks/Files/grainsales.csv')

# Which was the best month for sales? How much was earned that month?
monthly_sales = df.groupby('Months')['Sales'].sum()

best_month = monthly_sales.idxmax()

best_month_sales = monthly_sales[best_month]

print("Best Month for Sales:", best_month)
print("Sales Amount:", best_month_sales)

# Which product sold the most?
product_sales = df.groupby('GrainName')['Sales'].sum()

best_product = product_sales.idxmax()

best_product_sales = product_sales[best_product]

print("Best Selling Product:", best_product)
print("Sales Amount:", best_product_sales)
```

Output:

```
Best Month for Sales: JULY
Sales Amount: 16000000
Best Selling Product: Wheat
Sales Amount: 16000000
```

Code:

```
import pandas as pd
import itertools

# Read the CSV file into a DataFrame
df = pd.read_csv('/content/drive/MyDrive/Colab
Notebooks/Files/grainsales.csv')

# Example of Pandas operations:

# 1. Group by 'GrainName' and calculate the sum of sales
grouped_sales = df.groupby('GrainName')['Sales'].sum()
print(grouped_sales)

# 2. Filter the DataFrame based on a condition
filtered_data = df[df['State'] == 'Maharashtra']
print(filtered_data)

# 3. Sort the DataFrame by 'Sales' in descending order
sorted_data = df.sort_values('Sales', ascending=False)
print(sorted_data)

# 4. Calculate the total sales for each month
monthly_sales = df.groupby('Months')['Sales'].sum()
print(monthly_sales)

# 5. Calculate the average sales for each grain
average_sales = df.groupby('GrainName')['Sales'].mean()
print(average_sales)

# 6. Count the number of occurrences of each grain
grain_counts = df['GrainName'].value_counts()
print(grain_counts)

# 7. Calculate the total sales for each state and city
state_city_sales = df.groupby(['State', 'City'])['Sales'].sum()
print(state_city_sales)

# 8. Select rows where the sales are greater than 2 million
high_sales = df[df['Sales'] > 2000000]
print(high_sales)

# 9. Add a new column 'Total' that represents the cumulative sales for
each grain
df['Total'] = df.groupby('GrainName')['Sales'].cumsum()
print(df)

# 10. Calculate the maximum sales for each month and year
```

```
max_sales = df.groupby(['Months', 'Year'])['Sales'].max()
print(max_sales)

# 11. Remove duplicate rows from the DataFrame
df = df.drop_duplicates()
print(df)

# 12. Rename the columns
df = df.rename(columns={'GrainName': 'Grain', 'State': 'StateName',
'City': 'CityName'})
print(df)

# 13. Reset the index of the DataFrame
df = df.reset_index(drop=True)
print(df)

# 14. Export the DataFrame to a CSV file
df.to_csv('output.csv', index=False)
```

Output:

```
GrainName
Bajra            6000000
Brown rice      14000000
Corn            13500000
Oats             4000000
Ragi             5000000
Sattu            5000000
Sooji            9000000
Wheat           16000000
Name: Sales, dtype: int64
   GrainName        State     City Months  Year     Sales
0       Ragi  Maharashtra  Nagpur    JAN  2023  1000000
2       Ragi  Maharashtra  Nagpur    JAN  2023  1000000
4       Ragi  Maharashtra  Nagpur    JAN  2023  1000000
12      Ragi  Maharashtra  Nagpur    JAN  2023  1000000
24      Ragi  Maharashtra  Nagpur    JAN  2023  1000000
      GrainName        State       City Months  Year     Sales
19         Corn           UP     Kanpur    AUG  2023  4500000
23         Corn           UP     Kanpur    AUG  2023  4500000
11         Corn           UP     Kanpur    AUG  2023  4500000
26        Wheat  West Bengol   Asansole   JULY  2023  4000000
18        Wheat  West Bengol   Asansole   JULY  2023  4000000
22        Wheat  West Bengol   Asansole   JULY  2023  4000000
10        Wheat  West Bengol   Asansole   JULY  2023  4000000
9   Brown rice    Telangana  Hyderabad   JUNE  2023  3500000
21  Brown rice    Telangana  Hyderabad   JUNE  2023  3500000
25  Brown rice    Telangana  Hyderabad   JUNE  2023  3500000
17  Brown rice    Telangana  Hyderabad   JUNE  2023  3500000
8         Sooji   Tamil Nadu    Madurai    MAY  2023  3000000
```

20	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000
16	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000
7	Sattu	Gujarat	Surat	APRIL	2023	2500000
15	Sattu	Gujarat	Surat	APRIL	2023	2500000
6	Oats	Hariyana	Gurugram	MARCH	2023	2000000
14	Oats	Hariyana	Gurugram	MARCH	2023	2000000
13	Bajra	Panjab	Amritsar	FEB	2023	1500000
1	Bajra	Panjab	Amritsar	FEB	2023	1500000
5	Bajra	Panjab	Amritsar	FEB	2023	1500000
3	Bajra	Panjab	Amritsar	FEB	2023	1500000
12	Ragi	Maharashtra	Nagpur	JAN	2023	1000000
4	Ragi	Maharashtra	Nagpur	JAN	2023	1000000
24	Ragi	Maharashtra	Nagpur	JAN	2023	1000000
2	Ragi	Maharashtra	Nagpur	JAN	2023	1000000
0	Ragi	Maharashtra	Nagpur	JAN	2023	1000000

Months

APRIL	5000000
AUG	13500000
FEB	6000000
JAN	5000000
JULY	16000000
JUNE	14000000
MARCH	4000000
MAY	9000000

Name: Sales, dtype: int64

GrainName

Bajra	1500000.0
Brown rice	3500000.0
Corn	4500000.0
Oats	2000000.0
Ragi	1000000.0
Sattu	2500000.0
Sooji	3000000.0
Wheat	4000000.0

Name: Sales, dtype: float64

Ragi	5
Bajra	4
Brown rice	4
Wheat	4
Sooji	3
Corn	3
Oats	2
Sattu	2

Name: GrainName, dtype: int64

State	City	
Gujarat	Surat	5000000
Hariyana	Gurugram	4000000
Maharashtra	Nagpur	5000000
Panjab	Amritsar	6000000
Tamil Nadu	Madurai	9000000
Telangana	Hyderabad	14000000
UP	Kanpur	13500000
West Bengol	Asansole	16000000

Name: Sales, dtype: int64

	GrainName	State	City	Months	Year	Sales
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
15	Sattu	Gujarat	Surat	APRIL	2023	2500000
16	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000
17	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000
18	Wheat	West Bengol	Asansole	JULY	2023	4000000
19	Corn	UP	Kanpur	AUG	2023	4500000
20	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000
21	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000
22	Wheat	West Bengol	Asansole	JULY	2023	4000000
23	Corn	UP	Kanpur	AUG	2023	4500000
25	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000
26	Wheat	West Bengol	Asansole	JULY	2023	4000000

	GrainName	State	City	Months	Year	Sales	Total
0	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	1000000
1	Bajra	Panjab	Amritsar	FEB	2023	1500000	1500000
2	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	2000000
3	Bajra	Panjab	Amritsar	FEB	2023	1500000	3000000
4	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	3000000
5	Bajra	Panjab	Amritsar	FEB	2023	1500000	4500000
6	Oats	Hariyana	Gurugram	MARCH	2023	2000000	2000000
7	Sattu	Gujarat	Surat	APRIL	2023	2500000	2500000
8	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	3000000
9	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	3500000
10	Wheat	West Bengol	Asansole	JULY	2023	4000000	4000000
11	Corn	UP	Kanpur	AUG	2023	4500000	4500000
12	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	4000000
13	Bajra	Panjab	Amritsar	FEB	2023	1500000	6000000
14	Oats	Hariyana	Gurugram	MARCH	2023	2000000	4000000
15	Sattu	Gujarat	Surat	APRIL	2023	2500000	5000000
16	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	6000000
17	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	7000000
18	Wheat	West Bengol	Asansole	JULY	2023	4000000	8000000
19	Corn	UP	Kanpur	AUG	2023	4500000	9000000
20	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	9000000
21	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	10500000
22	Wheat	West Bengol	Asansole	JULY	2023	4000000	12000000
23	Corn	UP	Kanpur	AUG	2023	4500000	13500000
24	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	5000000
25	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	14000000
26	Wheat	West Bengol	Asansole	JULY	2023	4000000	16000000

Months	Year	
APRIL	2023	2500000
AUG	2023	4500000
FEB	2023	1500000
JAN	2023	1000000
JULY	2023	4000000
JUNE	2023	3500000
MARCH	2023	2000000
MAY	2023	3000000

Name: Sales, dtype: int64

	GrainName	State	City	Months	Year	Sales	Total
0	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	1000000
1	Bajra	Panjab	Amritsar	FEB	2023	1500000	1500000
2	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	2000000
3	Bajra	Panjab	Amritsar	FEB	2023	1500000	3000000
4	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	3000000
5	Bajra	Panjab	Amritsar	FEB	2023	1500000	4500000

6	Oats	Hariyana	Gurugram	MARCH	2023	2000000	2000000
7	Sattu	Gujarat	Surat	APRIL	2023	2500000	2500000
8	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	3000000
9	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	3500000
10	Wheat	West Bengol	Asansole	JULY	2023	4000000	4000000
11	Corn	UP	Kanpur	AUG	2023	4500000	4500000
12	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	4000000
13	Bajra	Panjab	Amritsar	FEB	2023	1500000	6000000
14	Oats	Hariyana	Gurugram	MARCH	2023	2000000	4000000
15	Sattu	Gujarat	Surat	APRIL	2023	2500000	5000000
16	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	6000000
17	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	7000000
18	Wheat	West Bengol	Asansole	JULY	2023	4000000	8000000
19	Corn	UP	Kanpur	AUG	2023	4500000	9000000
20	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	9000000
21	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	10500000
22	Wheat	West Bengol	Asansole	JULY	2023	4000000	12000000
23	Corn	UP	Kanpur	AUG	2023	4500000	13500000
24	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	5000000
25	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	14000000
26	Wheat	West Bengol	Asansole	JULY	2023	4000000	16000000

	Grain	StateName	CityName	Months	Year	Sales	Total
0	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	1000000
1	Bajra	Panjab	Amritsar	FEB	2023	1500000	1500000
2	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	2000000
3	Bajra	Panjab	Amritsar	FEB	2023	1500000	3000000
4	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	3000000
5	Bajra	Panjab	Amritsar	FEB	2023	1500000	4500000
6	Oats	Hariyana	Gurugram	MARCH	2023	2000000	2000000
7	Sattu	Gujarat	Surat	APRIL	2023	2500000	2500000
8	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	3000000
9	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	3500000
10	Wheat	West Bengol	Asansole	JULY	2023	4000000	4000000
11	Corn	UP	Kanpur	AUG	2023	4500000	4500000
12	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	4000000
13	Bajra	Panjab	Amritsar	FEB	2023	1500000	6000000
14	Oats	Hariyana	Gurugram	MARCH	2023	2000000	4000000
15	Sattu	Gujarat	Surat	APRIL	2023	2500000	5000000
16	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	6000000
17	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	7000000
18	Wheat	West Bengol	Asansole	JULY	2023	4000000	8000000
19	Corn	UP	Kanpur	AUG	2023	4500000	9000000
20	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	9000000
21	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	10500000
22	Wheat	West Bengol	Asansole	JULY	2023	4000000	12000000
23	Corn	UP	Kanpur	AUG	2023	4500000	13500000
24	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	5000000
25	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	14000000
26	Wheat	West Bengol	Asansole	JULY	2023	4000000	16000000

	Grain	StateName	CityName	Months	Year	Sales	Total
0	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	1000000
1	Bajra	Panjab	Amritsar	FEB	2023	1500000	1500000
2	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	2000000
3	Bajra	Panjab	Amritsar	FEB	2023	1500000	3000000
4	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	3000000
5	Bajra	Panjab	Amritsar	FEB	2023	1500000	4500000
6	Oats	Hariyana	Gurugram	MARCH	2023	2000000	2000000
7	Sattu	Gujarat	Surat	APRIL	2023	2500000	2500000

8	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	3000000
9	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	3500000
10	Wheat	West Bengol	Asansole	JULY	2023	4000000	4000000
11	Corn	UP	Kanpur	AUG	2023	4500000	4500000
12	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	4000000
13	Bajra	Panjab	Amritsar	FEB	2023	1500000	6000000
14	Oats	Hariyana	Gurugram	MARCH	2023	2000000	4000000
15	Sattu	Gujarat	Surat	APRIL	2023	2500000	5000000
16	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	6000000
17	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	7000000
18	Wheat	West Bengol	Asansole	JULY	2023	4000000	8000000
19	Corn	UP	Kanpur	AUG	2023	4500000	9000000
20	Sooji	Tamil Nadu	Madurai	MAY	2023	3000000	9000000
21	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	10500000
22	Wheat	West Bengol	Asansole	JULY	2023	4000000	12000000
23	Corn	UP	Kanpur	AUG	2023	4500000	13500000
24	Ragi	Maharashtra	Nagpur	JAN	2023	1000000	5000000
25	Brown rice	Telangana	Hyderabad	JUNE	2023	3500000	14000000
26	Wheat	West Bengol	Asansole	JULY	2023	4000000	16000000

Google Colab Link: https://colab.research.google.com/drive/1rZetINUegCObbBIM3zcBBY-G5tQh9HjU?usp=sharing