FY B.tech 2022-23

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Div: E3

Roll No: 546

PRN: 202201040078

Sub: EDS LAB Assignment 4 and IA Assignment 1

Code:

```python
import pandas as pd

# Load the CSV file into a DataFrame
data = pd.read_csv("D:\python progs\LAB\Assig 4\grainsales.csv")

# Convert the 'Sales' column to numeric
data['Sales'] = pd.to_numeric(data['Sales'])
print("\n\nName:Shivam Pokharkar\nRoll no:546\nDiv:E3\nPRN:202201040078\nFY
Btech 2022-23\nSUB: EDS LAB Assignment 4 and IA Assig 1")


print("\n\n_____LAB ASSIGNMENT 4_____")

# Question 1: Which was the best month for sales? How much was earned that
month?
monthly_sales = data.groupby('Months')['Sales'].sum()
best_month = monthly_sales.idxmax()
earnings = monthly_sales.max()
print("\n\nQuestion 1: Which was the best month for sales? How much was earned
that month?")
print("Best month for sales:", best_month)
print("Earnings in the best month:", earnings)

# Question 2: Which product sold the most? Why do you think it did?
product_sales = data.groupby('GrainName')['Sales'].sum()
best_product = product_sales.idxmax()
print("\n\nQuestion 2: Which product sold the most? Why do you think it did?")
print("Best-selling product:", best_product)

# Question 3: Which city sold the most products?
city_sales = data.groupby('City')['Sales'].sum()
```

```python
best_city = city_sales.idxmax()
print("\n\nQuestion 3: Which city sold the most products?")
print("City with the most product sales:", best_city)

# Question 4: What products are most often sold together?
product_combinations = data.groupby(['GrainName', 'State'])['Sales'].count()
most_sold_together = product_combinations.idxmax()
print("\n\nQuestion 4: What products are most often sold together?")
print("Products most often sold together:", most_sold_together)


#Extended assignment 1 10 problems on same file:


#Problem 1: Calculate the total sales for each state.
state_sales = data.groupby('State')['Sales'].sum()
print("\n\n_____IA Assignment 1_____")
print("\n\nProblem 1: Calculate the total sales for each state.\n")
print("Total sales by state:\n", state_sales)
print("_____")

#Problem 2: Determine the average sales per month.
print("\n\n#Problem 2: Determine the average sales per month.\n")
monthly_average_sales = data.groupby('Months')['Sales'].mean()
print("\nAverage sales per month:\n", monthly_average_sales)
print("_____")

#Problem 3: Find the product with the highest sales in each month.
print("\n\nProblem 3: Find the product with the highest sales in each
month\n")
monthly_best_product = data.groupby(['Months',
'GrainName'])['Sales'].sum().reset_index()
idx = monthly_best_product.groupby('Months')['Sales'].idxmax()
best_product_per_month = monthly_best_product.loc[idx, ['Months', 'GrainName',
'Sales']]
print("Product with highest sales in each month:\n", best_product_per_month)
print("_____")


#Problem 4: Calculate the total sales for each year.
print("\n\nProblem 4: Calculate the total sales for each year.\n")
yearly_sales = data.groupby('Year')['Sales'].sum()
print("Total sales by year:\n", yearly_sales)
print("_____")

#Problem 5: Determine the average sales for each city.
print("\n\nProblem 5: Determine the average sales for each city.\n")
city_average_sales = data.groupby('City')['Sales'].mean()
print("Average sales per city:\n", city_average_sales)
```

```python
print("_____")


#Problem 6: Find the top 3 products that generated the highest revenue.
print("\n\nProblem 6: Find the top 3 products that generated the highest
revenue.\n")
top_products = data.groupby('GrainName')['Sales'].sum().nlargest(3)
print("Top 3 products by revenue:\n", top_products)
print("_____")


#Problem 7: Calculate the total sales for each grain type in each state.
print("\n\nProblem 7: Calculate the total sales for each grain type in each
state.\n")
grain_state_sales = data.groupby(['GrainName', 'State'])['Sales'].sum()
print("Total sales by grain and state:\n", grain_state_sales)
print("_____")


#Problem 8: Determine the month and year with the highest sales.
print("\n\nProblem 8: Determine the month and year with the highest sales.\n")

data['MonthYear'] = data['Months'] + ' ' + data['Year'].astype(str)
month_year_sales = data.groupby('MonthYear')['Sales'].sum()
best_month_year = month_year_sales.idxmax()
print("Month and year with the highest sales:", best_month_year)
print("_____")


#Problem 9: Find the city with the highest average sales.
print("\n\nProblem 9: Find the city with the highest average sales.\n")
city_average_sales = data.groupby('City')['Sales'].mean()
best_city_average_sales = city_average_sales.idxmax()
print("City with the highest average sales:", best_city_average_sales)
print("_____")


#Problem 10: Determine the total sales for each grain type in the year 2023.
print("\n\nProblem 10: Determine the total sales for each grain type in the
year 2023.\n")
yearly_grain_sales = data[data['Year'] ==
2023].groupby('GrainName')['Sales'].sum()
print("Total sales by grain in 2023:\n", yearly_grain_sales)
print("\n\n_____END_____\n\n")
```

Screenshot:

LabAssignment4.ipynb   LAB assig 4 and assig 1.py ✕   Untitled-1.ipynb

```
19
20    # Question 2: Which product sold the most? Why do you think it did?
```

PROBLEMS 1   OUTPUT   DEBUG CONSOLE   TERMINAL   JUPYTER

```
Name:Shivam Pokharkar
Roll no:546
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_____LAB ASSIGNMENT 4_____


Question 1: Which was the best month for sales? How much was earned that month?
Best month for sales: JULY
Earnings in the best month: 16000000


Question 2: Which product sold the most? Why do you think it did?
Best-selling product: Wheat


Question 3: Which city sold the most products?
City with the most product sales: Asansole


Question 4: What products are most often sold together?
Products most often sold together: ('Ragi', 'Maharashtra')


_____IA Assignment 1_____
```

LabAssignment4.ipynb   LAB assig 4 and assig 1.py ✕   Untitled-1.ipynb

```
19
20    # Question 2: Which product sold the most? Why do you think it did?
```

PROBLEMS 1   OUTPUT   DEBUG CONSOLE   TERMINAL   JUPYTER

```
Problem 1: Calculate the total sales for each state.

Total sales by state:
 State
Gujarat        5000000
Hariyana       4000000
Maharashtra    5000000
Panjab         6000000
Tamil Nadu     9000000
Telangana      14000000
UP             13500000
West Bengol    16000000
Name: Sales, dtype: int64
_____


#Problem 2: Determine the average sales per month.

Average sales per month:
 Months
APRIL    2500000.0
AUG      4500000.0
FEB      1500000.0
JAN      1000000.0
JULY     4000000.0
JUNE     3500000.0
MARCH    2000000.0
MAY      3000000.0
Name: Sales, dtype: float64
_____
```

LabAssignment4.ipynb   LAB assig 4 and assig 1.py ✕   Untitled-1.ipynb ●

```
19
20   # Question 2: Which product sold the most? Why do you think it did?
```

PROBLEMS 1   OUTPUT   DEBUG CONSOLE   TERMINAL   JUPYTER

```
Problem 3: Find the product with the highest sales in each month

Product with highest sales in each month:
   Months    GrainName      Sales
0  APRIL        Sattu     5000000
1    AUG         Corn    13500000
2    FEB        Bajra     6000000
3    JAN         Ragi     5000000
4   JULY        Wheat    16000000
5   JUNE   Brown rice    14000000
6  MARCH         Oats     4000000
7    MAY        Sooji     9000000
_____


Problem 4: Calculate the total sales for each year.

Total sales by year:
 Year
2023    72500000
Name: Sales, dtype: int64
_____


Problem 5: Determine the average sales for each city.

Average sales per city:
 City
Amritsar     1500000.0
Asansole     4000000.0
Gurugram     2000000.0
```

Ln 43, Col 51   Spaces: 4   UTF-8   CRLF   Python   3.11.3 64-bit

PROBLEMS 1   OUTPUT   DEBUG CONSOLE   TERMINAL   JUPYTER

```
Problem 5: Determine the average sales for each city.

Average sales per city:
 City
Amritsar     1500000.0
Asansole     4000000.0
Gurugram     2000000.0
Hyderabad    3500000.0
Kanpur       4500000.0
Madurai      3000000.0
Nagpur       1000000.0
Surat        2500000.0
Name: Sales, dtype: float64
_____


Problem 6: Find the top 3 products that generated the highest revenue.

Top 3 products by revenue:
 GrainName
Wheat         16000000
Brown rice    14000000
Corn          13500000
Name: Sales, dtype: int64
_____


Problem 7: Calculate the total sales for each grain type in each state.

Total sales by grain and state:
 GrainName    State
Bajra        Panjab       6000000
Brown rice   Telangana   14000000
Corn         UP          13500000
Oats         Hariyana     4000000
```

Ln 43, Col 51   Spaces: 4   UTF-8   CRLF   Python   3.11.3 64-bit

```
Problem 6: Find the top 3 products that generated the highest revenue.

Top 3 products by revenue:
 GrainName
Wheat          16000000
Brown rice     14000000
Corn           13500000
Name: Sales, dtype: int64
_____


Problem 7: Calculate the total sales for each grain type in each state.

Total sales by grain and state:
 GrainName    State
Bajra        Panjab        6000000
Brown rice   Telangana    14000000
Corn         UP           13500000
Oats         Hariyana      4000000
Ragi         Maharashtra   5000000
Sattu        Gujarat       5000000
Sooji        Tamil Nadu    9000000

Problem 8: Determine the month and year with the highest sales.

Month and year with the highest sales: JULY 2023
_____


Problem 9: Find the city with the highest average sales.

City with the highest average sales: Kanpur
_____
```

```
Problem 8: Determine the month and year with the highest sales.

Month and year with the highest sales: JULY 2023
_____


Problem 9: Find the city with the highest average sales.

City with the highest average sales: Kanpur
_____


Problem 10: Determine the total sales for each grain type in the year 2023.

Total sales by grain in 2023:
 GrainName
Bajra          6000000
Brown rice    14000000
Corn          13500000
Oats           4000000
Ragi           5000000
Sattu          5000000
Sooji          9000000
Wheat         16000000
Name: Sales, dtype: int64


_____END_____

PS C:\Users\shiva>
```