# Assignment

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Read any real-life dataset. Store the data into Data Frames. Identify 10 grains for the given dataset.

Implement all 20 grains using Pandas methods. The Sample Grains for Sales Dataset as:

- Which was the best month for sales? How much was earned that month?

- Which product sold the most? Why do you think it did?

- Which city sold the most products?

- What Products are most often sold together?

```
import pandas as pd

from itertools import combinations

from collections import Counter


df = pd.read_csv('/content/grainsales (2).csv')

print(df)


df['Sales'] = pd.to_numeric(df['Sales'])
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monthly_sales = df.groupby('Months')['Sales'].sum()
best_month = monthly_sales.idxmax()
earnings = monthly_sales.loc[best_month]
print("The best month for sales was", best_month)
print("The earnings for that month were", earnings)

product_sales = df.groupby('GrainName')['Sales'].sum()
best_product = product_sales.idxmax()
print("The product that sold the most is", best_product)

city_sales = df.groupby('City')['Sales'].sum()
best_city = city_sales.idxmax()
print("The city that sold the most products is", best_city)

# Read the CSV file into a DataFrame
df = pd.read_csv('/content/grainsales (2).csv')

# Group the data by sales and create a list of products for each sale
grouped_sales = df.groupby('Sales')['GrainName'].apply(list)

# Create a list of all product combinations for each sale
product_combinations = [list(combinations(products, 2)) for products in
grouped_sales]

# Flaten the list of combinations
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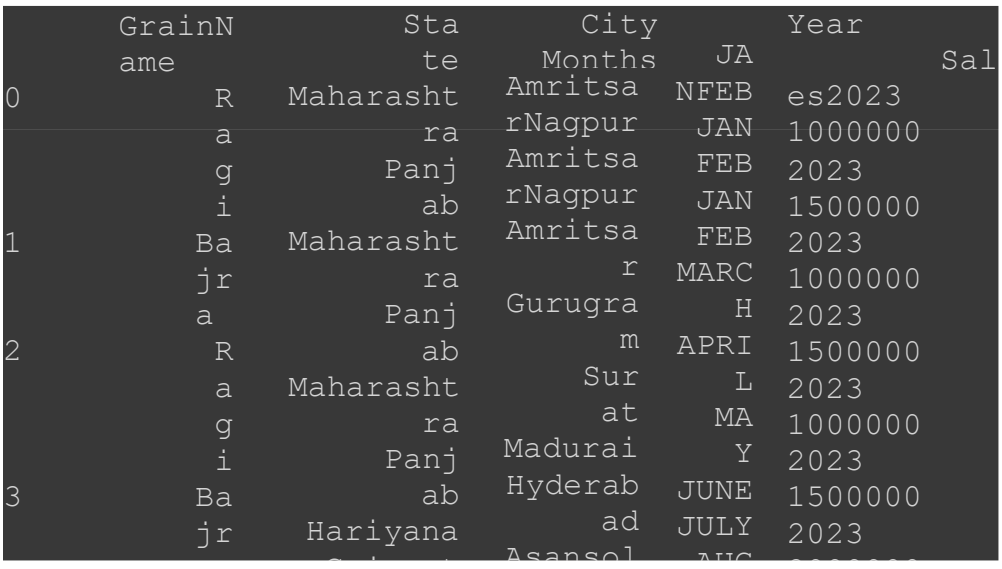
```
flatened_combinations = [item for sublist in product_combinations for item in sublist]

# Count the occurrences of each product combination
combination_counts = Counter(flatened_combinations)

# Find the most common product combinations
most_common_combinations = combination_counts.most_common()

# Print the result
print("The most frequently sold product combinations are:")
for combination, count in most_common_combinations:
    print(combination[0], "and", combination[1], "- Sold together", count, "times")
```

# OUTPUT:



| | GrainName | State | City | Months | JA | Year | Sal |
|---|---|---|---|---|---|---|---|
| 0 | Ragi | Maharashtra | Amritsar | NFEB | es2023 | | |
| | | Panjab | Nagpur | JAN | 1000000 | | |
| 1 | Bajra | Maharashtra | Amritsar | FEB | 2023 | | |
| | | Panjab | Nagpur | JAN | 1500000 | | |
| 2 | Ragi | Maharashtra | Amritsar | FEB | 2023 | | |
| | | Panjab | Gurugram | MARCH | 1000000 | | |
| 3 | Bajr | Hariyana | Surat | APRIL | 2023 | | |
| | | | Madurai | MAY | 1500000 | | |
| | | | Hyderabad | JUNE | 2023 | | |
| | | | Asansol | JULY | | | |

```
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
24         Ragi  Maharashtra     Nagpur    JAN  2023  1000000
25  Brown rice     Telangana  Hyderabad   JUNE  2023  3500000
26        Wheat  West Bengol   Asansole   JULY  2023  4000000
The best month for sales was JULY
The earnings for that month were 16000000
The product that sold the most is Wheat
The city that sold the most products is Asansole
The most frequently sold product combinations are:
Ragi and Ragi - Sold together 10 times
Bajra and Bajra - Sold together 6 times
Brown rice  and Brown rice  - Sold together 6 times
Wheat and Wheat - Sold together 6 times
Sooji and Sooji - Sold together 3 times
Corn and Corn - Sold together 3 times
Oats and Oats - Sold together 1 times
Sattu  and Sattu  - Sold together 1 times
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