**1.Top Customers Analysis: Identifying Customers with Highest Number of Items Purchased**

Your task is to identify the customers who have bought the most number of items from our sales data. This analysis will help us identify our top customers and understand their purchasing behavior.

Example approach\_FifthQuestion

1: Group the DataFrame df by 'customer\_id' and 'customer\_name' columns and calculate the sum of the 'quantity' column for each customer.

group\_data = df.groupby(['customer\_id', 'customer\_name']).sum()

2: Reset the index of the group\_data DataFrame to make the grouped columns accessible as regular columns.

group\_data = group\_data.reset\_index()

3: Create a new DataFrame called loyal\_cust by selecting the 'customer\_id', 'customer\_name', and 'quantity' columns from the group\_data DataFrame.

loyal\_cust = group\_data.loc[:, ['customer\_id', 'customer\_name', 'quantity']]

4: Sort the loyal\_cust DataFrame by 'quantity' column in descending order and select the top 10 rows using .head(10).

top\_loyal\_cust = loyal\_cust.sort\_values('quantity', ascending=False).head(10)

5: Print the top\_loyal\_cust DataFrame to display the top 10 customers with the highest quantities.

print(top\_loyal\_cust)

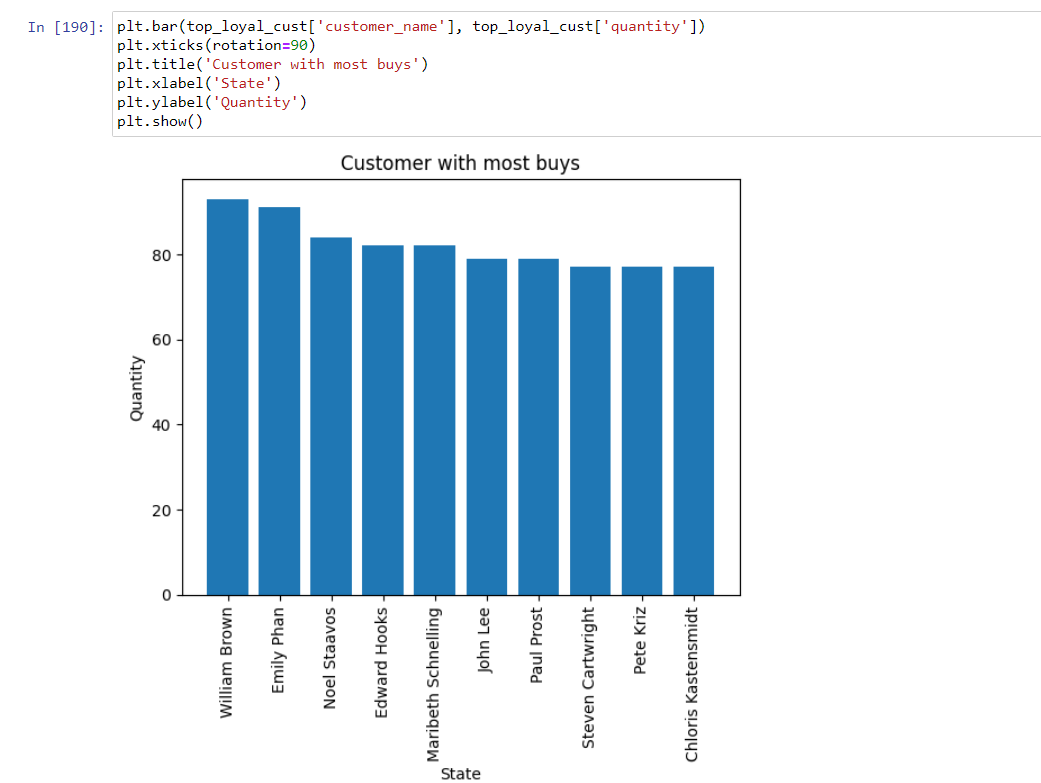
6: Create a bar chart using the 'customer\_name' column as the x-axis values and the 'quantity' column as the y-axis values.

plt.bar(top\_loyal\_cust['customer\_name'], top\_loyal\_cust['quantity'])

7: In the same code block, rotate the x-axis labels by 90 degrees using plt.xticks(rotation=90) and  add a title to the chart using plt.title('Top Customers').

8: In the same code block, add labels for the x-axis and y-axis using plt.xlabel('State') and plt.ylabel('Quantity'), respectively and display the chart using  plt.show().

**You output should look like this:**

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