```
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#650
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#BATCH-F3


import numpy as np
import pandas as pd
all_data=pd.read_csv("/content/1686715083343_all_data (7).csv")
all_data.head()
```

	Order ID	Product	Quantity Ordered	Price Each	Order Date	Purchase Address
0	176559.0	Bose SoundSport Headphones	1.0	99.99	04-07-2019 22:30	682 Chestnut St, Boston, MA 02215
1	176560.0	Google Phone	1.0	600.00	04-12-2019 14:38	669 Spruce St, Los Angeles, CA 90001
2	176560.0	Wired Headphones	1.0	11.99	04-12-2019 14:38	669 Spruce St, Los Angeles, CA 90001
3	176561.0	Wired Headphones	1.0	11.99	05/30/19 9:27	333 8th St, Los Angeles, CA 90001

```
#clean up the data
all_data.shape
```

```
(69, 6)
```

```
# drop rows of nana
nan_df=all_data[all_data.isna().any(axis=1)]
display(nan_df.head())
```

	Order ID	Product	Quantity Ordered	Price Each	Order Date	Purchase Address
36	NaN	NaN	NaN	NaN	NaN	NaN
51	NaN	NaN	NaN	NaN	NaN	NaN

```
all_data.shape
```

```
(69, 6)
```

```
all_data=all_data.dropna(how='all')
all_data.head()
```

	Order ID	Product	Quantity Ordered	Price Each	Order Date	Purchase Address
0	176559.0	Bose SoundSport Headphones	1.0	99.99	04-07-2019 22:30	682 Chestnut St, Boston, MA 02215
1	176560.0	Google Phone	1.0	600.00	04-12-2019 14:38	669 Spruce St, Los Angeles, CA 90001
2	176560.0	Wired Headphones	1.0	11.99	04-12-2019 14:38	669 Spruce St, Los Angeles, CA 90001
3	176561.0	Wired Headphones	1.0	11.99	05/30/19 9:27	333 8th St, Los Angeles, CA 90001

```
all_data.shape
```

```
(67, 6)
```

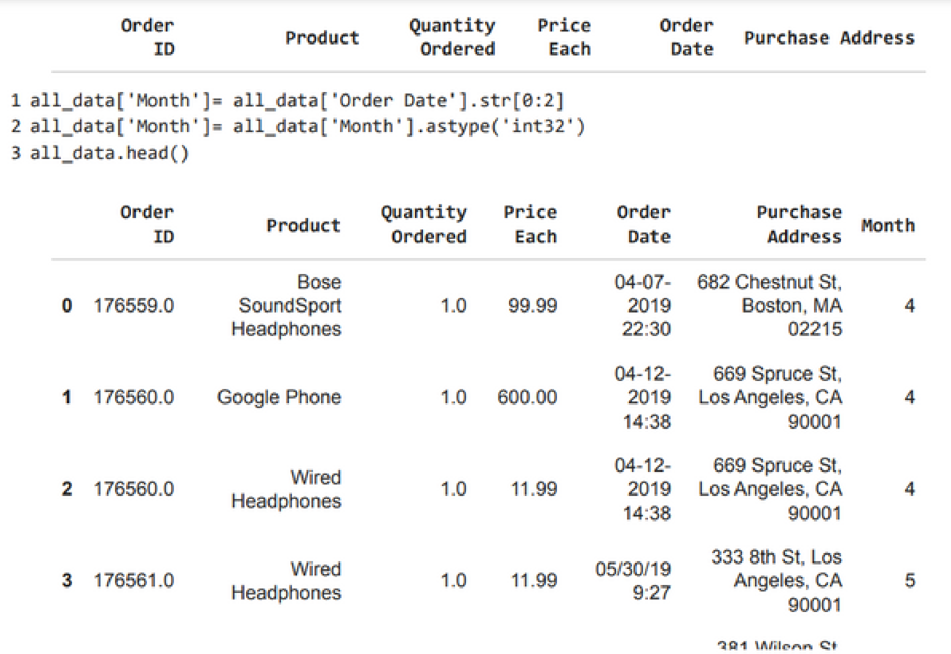
```
#get rid of text order date column
all_data=all_data[all_data['Order Date'].str[0:2]!='Or']
print(all_data)
```

```
                                  Order ID Product Quantity Ordered Price Each \
0 176559.0 Bose SoundSport Headphones 1.0 99.99
1 176560.0 Google Phone 1.0 600.00
2 176560.0 Wired Headphones 1.0 11.99
3 176561.0 Wired Headphones 1.0 11.99
4 176562.0 USB-C Charging Cable 1.0 11.95
.. ... ... ... ...
64 259329.0 Lightning Charging Cable 1.0 14.95
65 259330.0 AA Batteries (4-pack) 2.0 3.84
66 259331.0 Apple Airpods Headphones 1.0 150.00
67 259332.0 Apple Airpods Headphones 1.0 150.00
68 259333.0 Bose SoundSport Headphones 1.0 99.99

Order Date Purchase Address
0 04-07-2019 22:30 682 Chestnut St, Boston, MA 02215
1 04-12-2019 14:38 669 Spruce St, Los Angeles, CA 90001
2 04-12-2019 14:38 669 Spruce St, Los Angeles, CA 90001
3 05/30/19 9:27 333 8th St, Los Angeles, CA 90001
4 04/29/19 13:03 381 Wilson St, San Francisco, CA 94016
.. ... ...
64 09-05-2019 19:00 480 Lincoln St, Atlanta, GA 30301
65 09/25/19 22:01 763 Washington St, Seattle, WA 98101
66 09/29/19 7:00 770 4th St, New York City, NY 10001
67 09/16/19 19:21 782 Lake St, Atlanta, GA 30301
68 09/19/19 18:03 347 Ridge St, San Francisco, CA 94016

[67 rows x 6 columns]
```

```
#make column correct type
all_data['Quantity Ordered']=pd.to_numeric(all_data['Quantity Ordered'])
all_data['Price Each']=pd.to_numeric(all_data['Price Each'])
all_data.head()
```



	Order ID	Product	Quantity Ordered	Price Each	Order Date	Purchase Address

```
all_data['Month']= all_data['Order Date'].str[0:2]
all_data['Month']= all_data['Month'].astype('int32')
all_data.head()
```

	Order ID	Product	Quantity Ordered	Price Each	Order Date	Purchase Address	Month
0	176559.0	Bose SoundSport Headphones	1.0	99.99	04-07-2019 22:30	682 Chestnut St, Boston, MA 02215	4
1	176560.0	Google Phone	1.0	600.00	04-12-2019 14:38	669 Spruce St, Los Angeles, CA 90001	4
2	176560.0	Wired Headphones	1.0	11.99	04-12-2019 14:38	669 Spruce St, Los Angeles, CA 90001	4
3	176561.0	Wired Headphones	1.0	11.99	05/30/19 9:27	333 8th St, Los Angeles, CA 90001	5
						381 Wilson St	

```
#Add city column
def get_city(address):
return address.split(",")[1].strip(" ")
def get_state(address):
return address.split(",")[2].strip(" ")[1]

all_data['city']=all_data['Purchase Address'].apply(lambda x:f"{get_city(x)} ({get_state(x)}))")
all_data.head()

```

	Order ID	Product	Quantity Ordered	Price Each	Order Date	Purchase Address	Month	city
0	176559.0	Bose SoundSport Headphones	1.0	99.99	04-07-2019 22:30	682 Chestnut St, Boston, MA 02215	4	Boston (A))
1	176560.0	Google Phone	1.0	600.00	04-12-2019 14:38	669 Spruce St, Los Angeles, CA 90001	4	Los Angeles (A))
2	176560.0	Wired Headphones	1.0	11.99	04-12-2019 14:38	669 Spruce St, Los Angeles, CA 90001	4	Los Angeles (A))
3	176561.0	Wired	1.0	11.99	05/30/19	333 8th St, Los	5	Los Angeles

```
#waht was the best month for sales?how much was earned that month?
all_data['Sales']=all_data['Quantity Ordered'].astype('int')*all_data['Price Each'].astype('float')
```

```
all_data.groupby(['Month']).sum()

    <ipython-input-11-8fec2581ce34>:3: FutureWarning: The default value of numeric_onl
all_data.groupby(['Month']).sum()
```

Month	Order ID	Quantity Ordered	Price Each	Sales
4	7335546.0	123.0	885.80	1210.76
5	353124.0	2.0	111.98	111.98
6	184076.0	1.0	14.95	14.95
8	726962.0	9.0	23.92	50.83
9	2378802.0	17.0	591.44	616.62
10	550924.0	11.0	10.67	39.69
11	740314.0	19.0	13.66	65.31
12	550635.0	17.0	8.97	50.83

```
#2)WHICH CITY SOLD THE MOST PRODUCT?
Dummycity=all_data.groupby(['city'])
print(Dummycity)
#city_max=all_data.groupby(['city']).sum()
#print(max(city_max))

    <pandas.core.groupby.generic.DataFrameGroupBy object at 0x7f62dbe6fd00>
```

```
#waht products are most often sold together
df=all_data[all_data['Order ID'].duplicated(keep=False)]
df['Grouped']=df.groupby('Order ID')['Product'].transform(lambda x:','.join(x))
df2=df[['Order ID','Grouped']].drop_duplicates()
print(df['Grouped'])
```

```
1 Google Phone,Wired Headphones
2 Google Phone,Wired Headphones
Name: Grouped, dtype: object
<ipython-input-18-1970be6762a6>:3: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

    See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
 df['Grouped']=df.groupby('Order ID')['Product'].transform(lambda x:','.join(x))
```

```
from itertools import combinations
from collections import Counter

count=Counter()

for row in df2['Grouped']:
 row_list=row.split(',')
   count.update(Counter(combinations(row_list,2)))

for key,value in count.most_common(10):
 print(key,value)
```

```
      ('Google Phone', 'Wired Headphones') 1
```

```
product_group=all_data.groupby('Product')
quantity_ordered=product_group.sum()['Quantity Ordered']
```

```
      <ipython-input-20-11142b314e0e>:2: FutureWarning: The default value of numeric_only in DataFrameGroupBy.sum is deprecated. In a future version, numeric_only will default to False. Ei
   quantity_ordered=product_group.sum()['Quantity Ordered']
```

```
print(quantity_ordered)
```

```
Product
AA Batteries (4-pack) 64.0
AAA Batteries (4-pack) 109.0
Apple Airpods Headphones 3.0
Bose SoundSport Headphones 3.0
Google Phone 1.0
Lightning Charging Cable 4.0
USB-C Charging Cable 8.0
Wired Headphones 7.0
      Name: Quantity Ordered, dtype: float64
```

```
prices=all_data.groupby('Product').mean()['Price Each']
```

```
      <ipython-input-22-1f4f73bca841>:1: FutureWarning: The default value of numeric_only in DataFrameGroupBy.mean is deprecated. In a future version, numeric_only will default to False. E
 prices=all_data.groupby('Product').mean()['Price Each']
```

```
print(prices)
```

```
Product
              AA Batteries (4-pack) 3.84
             AAA Batteries (4-pack) 2.99
         Apple Airpods Headphones 150.00
        Bose SoundSport Headphones 99.99
                     Google Phone 600.00
          Lightning Charging Cable 14.95
              USB-C Charging Cable 11.95
                  Wired Headphones 11.99
    Name: Price Each, dtype: float64
```