

```
In [1]: #import Libraries
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
```

```
In [2]: df=pd.read_csv(r"C:\Users\PC\Desktop\product.csv")
df
```

Out[2]:

	Order_ID	Order_Date	Customer_Name	Salesperson	Region	Shipped_Date	Ship_Name	Pa
0	1001	27-01-2014	Company AA	Mariya Sergienko	West	29-01-2014	Karen Toh	
1	1002	27-01-2014	Company AA	Mariya Sergienko	West	29-01-2014	Karen Toh	
2	1003	4/1/2014	Company D	Andrew Cencini	East	6/1/2014	Christina Lee	
3	1004	4/1/2014	Company D	Andrew Cencini	East	6/1/2014	Christina Lee	
4	1005	4/1/2014	Company D	Andrew Cencini	East	6/1/2014	Christina Lee	
...	
384	1067	8/3/2014	Company H	Nancy Freehafer	North	10/3/2014	Elizabeth Andersen	
385	1070	3/3/2014	Company C	Mariya Sergienko	West	5/3/2014	Thomas Axerr	
386	1071	3/3/2014	Company C	Mariya Sergienko	West	5/3/2014	Thomas Axerr	
387	1075	10/3/2014	Company J	Laura Giussani	East	12/3/2014	Roland Wacker	
388	1077	10/3/2014	Company J	Laura Giussani	East	NaN	Roland Wacker	

389 rows × 12 columns



```
In [3]: df['Revenue']=df["Unit_Price"]*df["Quantity"]
df
```

Out[3]:

	Order_ID	Order_Date	Customer_Name	Salesperson	Region	Shipped_Date	Ship_Name	Pa
0	1001	27-01-2014	Company AA	Mariya Sergienko	West	29-01-2014	Karen Toh	
1	1002	27-01-2014	Company AA	Mariya Sergienko	West	29-01-2014	Karen Toh	
2	1003	4/1/2014	Company D	Andrew Cencini	East	6/1/2014	Christina Lee	
3	1004	4/1/2014	Company D	Andrew Cencini	East	6/1/2014	Christina Lee	
4	1005	4/1/2014	Company D	Andrew Cencini	East	6/1/2014	Christina Lee	
...	
384	1067	8/3/2014	Company H	Nancy Freehafer	North	10/3/2014	Elizabeth Andersen	
385	1070	3/3/2014	Company C	Mariya Sergienko	West	5/3/2014	Thomas Axerr	
386	1071	3/3/2014	Company C	Mariya Sergienko	West	5/3/2014	Thomas Axerr	
387	1075	10/3/2014	Company J	Laura Giussani	East	12/3/2014	Roland Wacker	
388	1077	10/3/2014	Company J	Laura Giussani	East	NaN	Roland Wacker	

389 rows × 13 columns



```
In [6]: regpay=df[['Region', 'Payment_Type', 'Revenue']]
regpay
```

Out[6]:

	Region	Payment_Type	Revenue
0	West	Check	686.0
1	West	Check	164.5
2	East	Credit Card	2070.0
3	East	Credit Card	4717.0
4	East	Credit Card	38.5
...
384	North	Credit Card	2192.4
385	West	Cash	480.0
386	West	Cash	2840.0
387	East	Credit Card	550.0
388	East	Cash	73.5

389 rows × 3 columns

```
In [7]: pay=regpay.groupby('Payment_Type').sum()
pay
```

C:\Users\PC\AppData\Local\Temp\ipykernel_3936\2291211207.py:1: FutureWarning: The default value of numeric_only in DataFrameGroupBy.sum is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only columns which should be valid for the function.

```
pay=regpay.groupby('Payment_Type').sum()
```

Out[7]:

	Revenue
Payment_Type	
Cash	145117.98
Check	276881.90
Credit Card	268933.41

```
In [8]: pay=regpay.groupby('Region').sum()
pay
```

C:\Users\PC\AppData\Local\Temp\ipykernel_3936\996961848.py:1: FutureWarning: The default value of numeric_only in DataFrameGroupBy.sum is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only columns which should be valid for the function.

```
pay=regpay.groupby('Region').sum()
```

Out[8]:

	Revenue
Region	
East	115557.16
North	361844.92
South	122747.18
West	90784.03

```
In [9]: pay=regpay.groupby(['Payment_Type', 'Region']).sum()
pay
```

Out[9]:

		Revenue
Payment_Type	Region	
Cash	East	45191.40
	North	48335.72
	South	21041.23
	West	30549.63
Check	East	2116.00
	North	184875.50
	South	43730.00
	West	46160.40
Credit Card	East	68249.76
	North	128633.70
	South	57975.95
	West	14074.00

```
In [10]: #filter data
filterdata=regpay.groupby(['Region', 'Payment_Type']).count()
filterdata
```

Out[10]:

		Revenue
Region	Payment_Type	
East	Cash	44
	Check	3
	Credit Card	41
North	Cash	36
	Check	45
	Credit Card	33
South	Cash	21
	Check	6
	Credit Card	54
West	Cash	28
	Check	45
	Credit Card	6

```
In [11]: filterdata['No.of Transaction']=filterdata['Revenue']
filterdata
```

Out[11]:

		Revenue	No.of Transaction
Region	Payment_Type		
East	Cash	44	44
	Check	3	3
	Credit Card	41	41
North	Cash	36	36
	Check	45	45
	Credit Card	33	33
South	Cash	21	21
	Check	6	6
	Credit Card	54	54
West	Cash	28	28
	Check	45	45
	Credit Card	6	6

```
In [12]: fd=filterdata.drop("Revenue",axis=1)
fd
```

Out[12]:

No.of Transaction		
Region	Payment_Type	
East	Cash	44
	Check	3
	Credit Card	41
North	Cash	36
	Check	45
	Credit Card	33
South	Cash	21
	Check	6
	Credit Card	54
West	Cash	28
	Check	45
	Credit Card	6

```
In [13]: data=fd.reset_index()
data
```

Out[13]:

	Region	Payment_Type	No.of Transaction
0	East	Cash	44
1	East	Check	3
2	East	Credit Card	41
3	North	Cash	36
4	North	Check	45
5	North	Credit Card	33
6	South	Cash	21
7	South	Check	6
8	South	Credit Card	54
9	West	Cash	28
10	West	Check	45
11	West	Credit Card	6

```
In [14]: regions=data['Region'].unique()
regions
```

Out[14]: array(['East', 'North', 'South', 'West'], dtype=object)

```
In [15]: regions1=data['Payment_Type'].unique()
regions1
```

```
Out[15]: array(['Cash', 'Check', 'Credit Card'], dtype=object)
```

```
In [16]: cash=data[data['Payment_Type']=='Cash']
cash
```

```
Out[16]:
```

	Region	Payment_Type	No.of Transaction
0	East	Cash	44
3	North	Cash	36
6	South	Cash	21
9	West	Cash	28

```
In [17]: check=data[data['Payment_Type']=='Check']
check
```

```
Out[17]:
```

	Region	Payment_Type	No.of Transaction
1	East	Check	3
4	North	Check	45
7	South	Check	6
10	West	Check	45

```
In [18]: credit_card=data[data['Payment_Type']=='Credit Card']
credit_card
```

```
Out[18]:
```

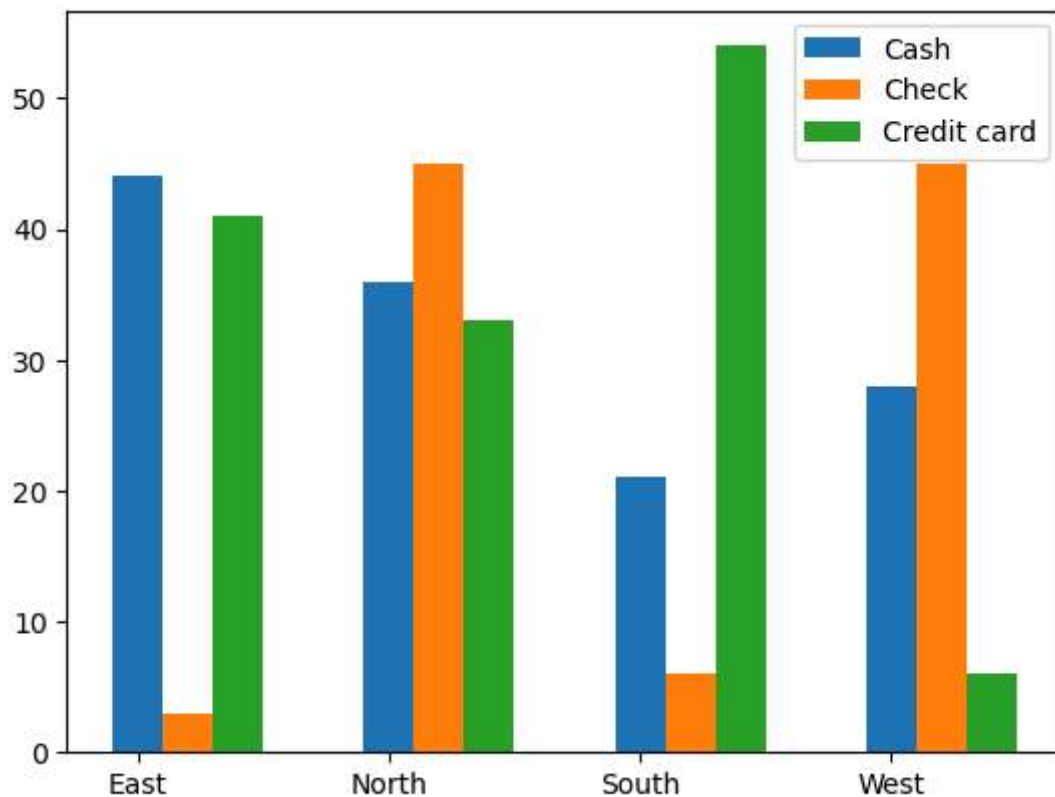
	Region	Payment_Type	No.of Transaction
2	East	Credit Card	41
5	North	Credit Card	33
8	South	Credit Card	54
11	West	Credit Card	6

```
In [20]: cs=np.array(cash['No.of Transaction'])
ck=np.array(check['No.of Transaction'])
cd=np.array(credit_card['No.of Transaction'])
print("Cash:",cs)
print("Check:",ck)
print("Credit card:",cd)
```

```
Cash: [44 36 21 28]
Check: [ 3 45  6 45]
Credit card: [41 33 54  6]
```

```
In [24]: #visualization
x_axis=np.arange(len(regions))
plt.bar(x_axis,cs,0.2,label="Cash")
plt.bar(x_axis+0.2,ck,0.2,label="Check")
plt.bar(x_axis+0.2+0.2,cd,0.2,label="Credit card")
plt.legend()
plt.xticks(x_axis,regions)
```

```
Out[24]: ([<matplotlib.axis.XTick at 0x13b98969300>,
<matplotlib.axis.XTick at 0x13b98968f40>,
<matplotlib.axis.XTick at 0x13b98968fa0>,
<matplotlib.axis.XTick at 0x13b9875fb80>],
[Text(0, 0, 'East'),
Text(1, 0, 'North'),
Text(2, 0, 'South'),
Text(3, 0, 'West')])
```



```
In [ ]:
```