

Run libraries

```
In [1]: import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings("ignore")
```

Display Data

```
In [2]: Orders = pd.read_excel("Company X - Order Report.xlsx")
Pincode_Zones = pd.read_excel("Company X - Pincode Zones.xlsx")
Sku = pd.read_excel("Company X - SKU Master.xlsx")
Invoices = pd.read_excel("Courier Company - Invoice.xlsx")
Couriess_Rates = pd.read_excel("Courier Company - Rates.xlsx")
```

```
In [3]: Orders.head()
```

```
Out[3]:
```

	ExternOrderNo	SKU	Order Qty
0	2001827036	8904223818706	1.0
1	2001827036	8904223819093	1.0
2	2001827036	8904223819109	1.0
3	2001827036	8904223818430	1.0
4	2001827036	8904223819277	1.0

```
In [4]: Sku.head()
```

```
Out[4]:
```

	SKU	Weight (g)
0	8904223815682	210
1	8904223815859	165
2	8904223815866	113
3	8904223815873	65
4	8904223816214	120

```
In [5]: Pincode_Zones.head()
```

Out[5]:

	Warehouse Pincode	Customer Pincode	Zone
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0	121003	507101	d
1	121003	486886	d
2	121003	532484	d
3	121003	143001	b
4	121003	515591	d

In [6]: Invoices.head()

Out[6]:

	AWB Code	Order ID	Charged Weight	Warehouse Pincode	Customer Pincode	Zone	Type of Shipment	Billing Amount (Rs.)
0	1091117222124	2001806232	1.30	121003	507101	d	Forward charges	135.0
1	1091117222194	2001806273	1.00	121003	486886	d	Forward charges	90.2
2	1091117222931	2001806408	2.50	121003	532484	d	Forward charges	224.6
3	1091117223244	2001806458	1.00	121003	143001	b	Forward charges	61.3
4	1091117229345	2001807012	0.15	121003	515591	d	Forward charges	45.4

In [7]: Couries_Rates

Out[7]:

	Zone	Weight Slabs	Forward Fixed Charge	Forward Additional Weight Slab Charge	RTO Fixed Charge	RTO Additional Weight Slab Charge
0	A	0.50	29.5	23.6	13.6	23.6
1	B	1.00	33.0	28.3	20.5	28.3
2	C	1.25	40.1	38.9	31.9	38.9
3	D	1.50	45.4	44.8	41.3	44.8
4	E	2.00	56.6	55.5	50.7	55.5

Find out total weights in the Orders Dataset

In [8]: Orders['Total_Weight'] = Orders['SKU'].apply(lambda x: Sku[Sku['SKU'] == x]['Weight (g)'])

In [9]: # SKU se weight mapping create karna
sku_weight = Sku.groupby('SKU')['Weight (g)'].sum().to_dict()

In [10]: sku_weight

```
Out[10]: {8904223815682: 210,  
8904223815804: 160,  
8904223815859: 165,  
8904223815866: 113,  
8904223815873: 65,  
8904223816214: 120,  
8904223816665: 102,  
8904223817273: 65,  
8904223817334: 170,  
8904223817501: 350,  
8904223818430: 165,  
8904223818454: 232,  
8904223818478: 350,  
8904223818553: 115,  
8904223818577: 150,  
8904223818591: 120,  
8904223818614: 65,  
8904223818638: 137,  
8904223818645: 137,  
8904223818669: 240,  
8904223818683: 121,  
8904223818706: 127,  
8904223818713: 120,  
8904223818751: 113,  
8904223818850: 240,  
8904223818874: 100,  
8904223818881: 140,  
8904223818898: 140,  
8904223818935: 120,  
8904223818942: 133,  
8904223818980: 110,  
8904223818997: 490,  
8904223819017: 115,  
8904223819024: 112,  
8904223819031: 112,  
8904223819093: 150,  
8904223819109: 100,  
8904223819116: 30,  
8904223819123: 250,  
8904223819130: 350,  
8904223819147: 240,  
8904223819161: 115,  
8904223819239: 290,  
8904223819246: 290,  
8904223819253: 290,  
8904223819260: 130,  
8904223819277: 350,  
8904223819284: 350,  
8904223819291: 112,  
8904223819321: 600,  
8904223819338: 600,  
8904223819345: 165,  
8904223819352: 165,  
8904223819369: 170,  
8904223819437: 552,  
8904223819468: 240,  
8904223819499: 210,  
8904223819505: 210,  
8904223819512: 210,  
8904223819543: 300,
```

```
'GIFTBOX202001': 500,
'GIFTBOX202002': 1000,
'GIFTBOX202003': 500,
'GIFTBOX202004': 500,
'SACHETS001': 10}
```

```
In [11]: # Orders DataFrame mein SKU ke according weight map karna
Orders['Total_Weight'] = Orders['SKU'].apply(lambda x: sku_weight.get(x, 0))
```

Total Weight according to the Orders SKU Column

```
In [12]: Orders
```

```
Out[12]:
```

	ExternOrderNo	SKU	Order Qty	Total_Weight
0	2001827036	8904223818706	1.0	127
1	2001827036	8904223819093	1.0	150
2	2001827036	8904223819109	1.0	100
3	2001827036	8904223818430	1.0	165
4	2001827036	8904223819277	1.0	350
...
395	2001806229	8904223818942	1.0	133
396	2001806229	8904223818850	1.0	240
397	2001806226	8904223818850	2.0	240
398	2001806210	8904223816214	1.0	120
399	2001806210	8904223818874	1.0	100

400 rows × 4 columns

```
In [13]: Pincode_Zones.head()
```

```
Out[13]:
```

	Warehouse Pincode	Customer Pincode	Zone
0	121003	507101	d
1	121003	486886	d
2	121003	532484	d
3	121003	143001	b
4	121003	515591	d

```
In [14]: Invoices.head()
```

Out[14]:

	AWB Code	Order ID	Charged Weight	Warehouse Pincode	Customer Pincode	Zone	Type of Shipment	Billing Amount (Rs.)
0	1091117222124	2001806232	1.30	121003	507101	d	Forward charges	135.0
1	1091117222194	2001806273	1.00	121003	486886	d	Forward charges	90.2
2	1091117222931	2001806408	2.50	121003	532484	d	Forward charges	224.6
3	1091117223244	2001806458	1.00	121003	143001	b	Forward charges	61.3
4	1091117229345	2001807012	0.15	121003	515591	d	Forward charges	45.4

Analyze Charges Billed by Courier Company

```
In [15]: Delivery_Zone = Invoices.groupby("Zone")['Billing Amount (Rs.)'].sum().to_dict()
```

```
In [16]: Invoices['Charges Billed by Courier Company (Rs.)'] = Invoices['Zone'].apply(lambda x:
```

```
In [17]: Invoices
```

Out[17]:

	AWB Code	Order ID	Charged Weight	Warehouse Pincode	Customer Pincode	Zone	Type of Shipment	Billing Amount (Rs.)	Charge Billed Courier Company (Rs.)
0	1091117222124	2001806232	1.30	121003	507101	d	Forward charges	135.0	11357
1	1091117222194	2001806273	1.00	121003	486886	d	Forward charges	90.2	11357
2	1091117222931	2001806408	2.50	121003	532484	d	Forward charges	224.6	11357
3	1091117223244	2001806458	1.00	121003	143001	b	Forward charges	61.3	1969
4	1091117229345	2001807012	0.15	121003	515591	d	Forward charges	45.4	11357
...
119	1091118551656	2001812941	0.73	121003	325207	d	Forward charges	90.2	11357
120	1091117614452	2001809383	0.50	121003	303702	d	Forward and RTO charges	86.7	11357
121	1091120922803	2001820978	0.50	121003	313301	d	Forward charges	45.4	11357
122	1091121844806	2001811475	0.50	121003	173212	b	Forward charges	33.0	1969
123	1091121846136	2001811305	0.50	121003	302020	d	Forward charges	45.4	11357

124 rows × 9 columns



Find out Zones charged weight

```
In [18]: find_zone = Invoices.groupby('Zone')['Charged Weight'].sum().to_dict()
```

```
In [19]: Invoices['Zone_Category_Wiz_Total_Weight'] = Invoices['Zone'].apply(lambda x: find_zone[x])
```

```
In [20]: Invoices
```

Out[20]:

	AWB Code	Order ID	Charged Weight	Warehouse Pincode	Customer Pincode	Zone	Type of Shipment	Billing Amount (Rs.)	Charge Billed Courier Company (Rs.)
0	1091117222124	2001806232	1.30	121003	507101	d	Forward charges	135.0	11357
1	1091117222194	2001806273	1.00	121003	486886	d	Forward charges	90.2	11357
2	1091117222931	2001806408	2.50	121003	532484	d	Forward charges	224.6	11357
3	1091117223244	2001806458	1.00	121003	143001	b	Forward charges	61.3	1969
4	1091117229345	2001807012	0.15	121003	515591	d	Forward charges	45.4	11357
...
119	1091118551656	2001812941	0.73	121003	325207	d	Forward charges	90.2	11357
120	1091117614452	2001809383	0.50	121003	303702	d	Forward and RTO charges	86.7	11357
121	1091120922803	2001820978	0.50	121003	313301	d	Forward charges	45.4	11357
122	1091121844806	2001811475	0.50	121003	173212	b	Forward charges	33.0	1969
123	1091121846136	2001811305	0.50	121003	302020	d	Forward charges	45.4	11357

124 rows × 10 columns



In [21]: Invoices

Out[21]:

	AWB Code	Order ID	Charged Weight	Warehouse Pincode	Customer Pincode	Zone	Type of Shipment	Billing Amount (Rs.)	Charge Billed Courier Company (Rs.)
0	1091117222124	2001806232	1.30	121003	507101	d	Forward charges	135.0	11357
1	1091117222194	2001806273	1.00	121003	486886	d	Forward charges	90.2	11357
2	1091117222931	2001806408	2.50	121003	532484	d	Forward charges	224.6	11357
3	1091117223244	2001806458	1.00	121003	143001	b	Forward charges	61.3	1969
4	1091117229345	2001807012	0.15	121003	515591	d	Forward charges	45.4	11357
...
119	1091118551656	2001812941	0.73	121003	325207	d	Forward charges	90.2	11357
120	1091117614452	2001809383	0.50	121003	303702	d	Forward and RTO charges	86.7	11357
121	1091120922803	2001820978	0.50	121003	313301	d	Forward charges	45.4	11357
122	1091121844806	2001811475	0.50	121003	173212	b	Forward charges	33.0	1969
123	1091121846136	2001811305	0.50	121003	302020	d	Forward charges	45.4	11357

124 rows × 10 columns

Find out total amount of zones

```
In [22]: find_zone_amount = Invoices.groupby('Zone')['Billing Amount (Rs.)'].sum().to_dict()
```

```
In [23]: Invoices['Total_Amount_Zones'] = Invoices['Zone'].apply(lambda x: find_zone_amount.get(x, 0))
```

```
In [24]: Invoices.head()
```


Out[24]:

	AWB Code	Order ID	Charged Weight	Warehouse Pincode	Customer Pincode	Zone	Type of Shipment	Billing Amount (Rs.)	Charges Billed by Courier Company (Rs.)
0	1091117222124	2001806232	1.30	121003	507101	d	Forward charges	135.0	11357.5
1	1091117222194	2001806273	1.00	121003	486886	d	Forward charges	90.2	11357.5
2	1091117222931	2001806408	2.50	121003	532484	d	Forward charges	224.6	11357.5
3	1091117223244	2001806458	1.00	121003	143001	b	Forward charges	61.3	1969.9
4	1091117229345	2001807012	0.15	121003	515591	d	Forward charges	45.4	11357.5



In [25]:

Couries_Rates

Out[25]:

	Zone	Weight Slabs	Forward Fixed Charge	Forward Additional Weight Slab Charge	RTO Fixed Charge	RTO Additional Weight Slab Charge
0	A	0.50	29.5	23.6	13.6	23.6
1	B	1.00	33.0	28.3	20.5	28.3
2	C	1.25	40.1	38.9	31.9	38.9
3	D	1.50	45.4	44.8	41.3	44.8
4	E	2.00	56.6	55.5	50.7	55.5

In [26]:

Invoices

Out[26]:

	AWB Code	Order ID	Charged Weight	Warehouse Pincode	Customer Pincode	Zone	Type of Shipment	Billing Amount (Rs.)	Charge Billed Courier Company (Rs.)
0	1091117222124	2001806232	1.30	121003	507101	d	Forward charges	135.0	11357
1	1091117222194	2001806273	1.00	121003	486886	d	Forward charges	90.2	11357
2	1091117222931	2001806408	2.50	121003	532484	d	Forward charges	224.6	11357
3	1091117223244	2001806458	1.00	121003	143001	b	Forward charges	61.3	1969
4	1091117229345	2001807012	0.15	121003	515591	d	Forward charges	45.4	11357
...
119	1091118551656	2001812941	0.73	121003	325207	d	Forward charges	90.2	11357
120	1091117614452	2001809383	0.50	121003	303702	d	Forward and RTO charges	86.7	11357
121	1091120922803	2001820978	0.50	121003	313301	d	Forward charges	45.4	11357
122	1091121844806	2001811475	0.50	121003	173212	b	Forward charges	33.0	1969
123	1091121846136	2001811305	0.50	121003	302020	d	Forward charges	45.4	11357

124 rows × 11 columns



In [27]:

Couries_Rates

Out[27]:

	Zone	Weight Slabs	Forward Fixed Charge	Forward Additional Weight Slab Charge	RTO Fixed Charge	RTO Additional Weight Slab Charge
0	A	0.50	29.5	23.6	13.6	23.6
1	B	1.00	33.0	28.3	20.5	28.3
2	C	1.25	40.1	38.9	31.9	38.9
3	D	1.50	45.4	44.8	41.3	44.8
4	E	2.00	56.6	55.5	50.7	55.5

Find out Expected rates

```
In [28]: Expected_Rates = Couries_Rates.groupby([Invoices['Zone']])['Weight Slabs'].sum().to_dict()
```

```
In [29]: Expected_Rates
```

```
Out[29]: {'b': 1.5, 'd': 4.75}
```

```
In [30]: Invoices['Expected Rates'] = Invoices['Zone'].apply(lambda x: Expected_Rates.get(x, 0))
```

```
In [31]: Invoices.head()
```

```
Out[31]:
```

	AWB Code	Order ID	Charged Weight	Warehouse Pincode	Customer Pincode	Zone	Type of Shipment	Billing Amount (Rs.)	Charges Billed by Courier Company (Rs.)
0	1091117222124	2001806232	1.30	121003	507101	d	Forward charges	135.0	11357.5
1	1091117222194	2001806273	1.00	121003	486886	d	Forward charges	90.2	11357.5
2	1091117222931	2001806408	2.50	121003	532484	d	Forward charges	224.6	11357.5
3	1091117223244	2001806458	1.00	121003	143001	b	Forward charges	61.3	1969.9
4	1091117229345	2001807012	0.15	121003	515591	d	Forward charges	45.4	11357.5

Find out Total amount of courier

```
In [32]: Invoices['Total_Amount_By_Courier'] = Invoices['Total_Amount_Zones'] - Invoices['Expected Rates']
```

```
In [33]: Invoices.head()
```

Out[33]:

	AWB Code	Order ID	Charged Weight	Warehouse Pincode	Customer Pincode	Zone	Type of Shipment	Billing Amount (Rs.)	Charges Billed by Courier Company (Rs.)
0	1091117222124	2001806232	1.30	121003	507101	d	Forward charges	135.0	11357.5
1	1091117222194	2001806273	1.00	121003	486886	d	Forward charges	90.2	11357.5
2	1091117222931	2001806408	2.50	121003	532484	d	Forward charges	224.6	11357.5
3	1091117223244	2001806458	1.00	121003	143001	b	Forward charges	61.3	1969.9
4	1091117229345	2001807012	0.15	121003	515591	d	Forward charges	45.4	11357.5



Final Results

```
In [34]: Invoices.to_csv('Final_Results.csv', index=False)
```

```
In [ ]:
```