In [1]:
```
import pandas as pd
import numpy as np
from matplotlib import pyplot as plt
import seaborn as sns
%matplotlib inline
```

In [2]:
```
x_oders = pd.read_excel('Company X - Order Report.xlsx')
x_pincodes = pd.read_excel('Company X - Pincode Zones.xlsx')
x_skq = pd.read_excel('Company X - SKU Master.xlsx')
c_invoice = pd.read_excel('Courier Company - Invoice.xlsx')
c_rates = pd.read_excel('Courier Company - Rates.xlsx')
```

In [3]:
```
x_oders.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]:
```
x_oders.rename(columns={'ExternOrderNo':'Order ID'},inplace=True)
```

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

Out[5]:

	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 [6]:
```
x_skq.head()
```

Out[6]:

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

In [7]:
```
c_rates.head()
```

Out[7]:

	Zone	Weight Slabs	Forward Fixed Charge	Forward Additional Weight Slab Charge	RTO Fixed Charge	RTO Additional Weight Slab Charge
0	A	0.25	29.5	23.6	13.6	23.6
1	B	0.50	33.0	28.3	20.5	28.3
2	C	0.75	40.1	38.9	31.9	38.9
3	D	1.25	45.4	44.8	41.3	44.8
4	E	1.50	56.6	55.5	50.7	55.5

In [8]:
```
c_invoice.head()
```

Out[8]:

	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 [9]:
```
# joining dataframes
df = x_oders.merge(c_invoice,on='Order ID')[['Order ID','SKU','AWB Code','Zone','Type of Shipment']]
```

In [10]:
```
df = df.merge(x_skq,on='SKU')
```

In [11]:
```
#converting gram into kg
df['Weight (kg)'] = np.round(df['Weight (g)'] / 1000, decimals=2)
```

In [12]:
```
df
```

Out[12]:

	Order ID	SKU	AWB Code	Zone	Type of Shipment	Weight (g)	Weight (kg)
0	2001827036	8904223818706	1091122418320	b	Forward charges	127	0.13
1	2001821995	8904223818706	1091121183730	d	Forward charges	127	0.13
2	2001819252	8904223818706	1091120352712	b	Forward charges	127	0.13
3	2001816996	8904223818706	1091119429202	d	Forward charges	127	0.13
4	2001814580	8904223818706	1091118925110	d	Forward and RTO charges	127	0.13
...	...	...	...	...	...	...	...
396	2001806616	8904223819123	1091117225484	b	Forward charges	250	0.25
397	2001806567	8904223815804	1091117224902	d	Forward charges	160	0.16
398	2001806567	8904223818577	1091117224902	d	Forward charges	150	0.15
399	2001806408	8904223819437	1091117222931	d	Forward charges	552	0.55
400	2001806232	8904223818645	1091117222124	d	Forward charges	137	0.14

401 rows × 7 columns

In [13]:
```
# grouping data to calculate total weight as per order id
df = df.groupby(['Order ID','Zone','Type of Shipment','AWB Code']).sum('Weight (kg)').reset_index()
```

In [14]:
```
df = pd.DataFrame(df)
```

In [15]:
```
df['Weight (kg)'] = np.round(df['Weight (kg)'], decimals=2)
```

In [16]:
```
df.head()
```

Out[16]:

	Order ID	Zone	Type of Shipment	AWB Code	Weight (g)	Weight (kg)
0	2001806210	b	Forward charges	1091117221940	220	0.22
1	2001806226	d	Forward charges	1091117222065	240	0.24
2	2001806229	d	Forward charges	1091117222080	500	0.50
3	2001806232	d	Forward charges	1091117222124	377	0.38
4	2001806233	b	Forward charges	1091117222135	245	0.25

In [17]:
```
c_rates
```

Out[17]:

	Zone	Weight Slabs	Forward Fixed Charge	Forward Additional Weight Slab Charge	RTO Fixed Charge	RTO Additional Weight Slab Charge
0	A	0.25	29.5	23.6	13.6	23.6
1	B	0.50	33.0	28.3	20.5	28.3
2	C	0.75	40.1	38.9	31.9	38.9
3	D	1.25	45.4	44.8	41.3	44.8
4	E	1.50	56.6	55.5	50.7	55.5

In [18]:
```
# creating new column for get zone wise slab value
df['slab rates'] = df['Zone'].replace({'b':0.50, 'd':1.25, 'e':1.50})
```

In [19]:
```
df
```

Out[19]:

	Order ID	Zone	Type of Shipment	AWB Code	Weight (g)	Weight (kg)	slab rates
0	2001806210	b	Forward charges	1091117221940	220	0.22	0.50
1	2001806226	d	Forward charges	1091117222065	240	0.24	1.25
2	2001806229	d	Forward charges	1091117222080	500	0.50	1.25
3	2001806232	d	Forward charges	1091117222124	377	0.38	1.25
4	2001806233	b	Forward charges	1091117222135	245	0.25	0.50
...	...	...	...	...	...	...	...
119	2001821995	d	Forward charges	1091121183730	477	0.48	1.25
120	2001822466	d	Forward charges	1091121305541	352	0.35	1.25
121	2001823564	d	Forward and RTO charges	1091121666133	336	0.33	1.25
122	2001825261	d	Forward and RTO charges	1091121981575	611	0.61	1.25
123	2001827036	b	Forward charges	1091122418320	2039	2.04	0.50

124 rows × 7 columns

In [20]:
```
#giving conditons to if-else statements to fing X slab
l = []
for (i,r) in df.iterrows():
    if r['slab rates'] >= r['Weight (kg)']:
        l.append(r['slab rates'])
    elif r['slab rates'] * 2 >= r['Weight (kg)']:
        l.append(r['slab rates'] *2)
    elif r['slab rates'] * 3 >= r['Weight (kg)']:
        l.append(r['slab rates'] *3)
    elif r['slab rates'] * 4 >= r['Weight (kg)']:
        l.append(r['slab rates'] *4)
    elif r['slab rates'] * 5 >= r['Weight (kg)']:
        l.append(r['slab rates'] *5)
```

In [21]:
```
df['x_slab']= l
```

In [22]:
```
df
```

Out[22]:

	Order ID	Zone	Type of Shipment	AWB Code	Weight (g)	Weight (kg)	slab rates	x_slab
0	2001806210	b	Forward charges	1091117221940	220	0.22	0.50	0.50
1	2001806226	d	Forward charges	1091117222065	240	0.24	1.25	1.25
2	2001806229	d	Forward charges	1091117222080	500	0.50	1.25	1.25
3	2001806232	d	Forward charges	1091117222124	377	0.38	1.25	1.25
4	2001806233	b	Forward charges	1091117222135	245	0.25	0.50	0.50
...	...	...	...	...	...	...	...	...
119	2001821995	d	Forward charges	1091121183730	477	0.48	1.25	1.25
120	2001822466	d	Forward charges	1091121305541	352	0.35	1.25	1.25
121	2001823564	d	Forward and RTO charges	1091121666133	336	0.33	1.25	1.25
122	2001825261	d	Forward and RTO charges	1091121981575	611	0.61	1.25	1.25
123	2001827036	b	Forward charges	1091122418320	2039	2.04	0.50	2.50

124 rows × 8 columns

In [23]:
```
# join the invoice dataframe to get some imports columns
df1 = df.merge(c_invoice,on='Order ID')
```

In [24]:
```
#removing unwanted colums
df1.drop(columns=['AWB Code_y','Warehouse Pincode','Customer Pincode','Type of Shipment_y',
                  'Weight (g)'],inplace=True)
```

In [25]:
```
df1.head()
```

Out[25]:

	Order ID	Zone_x	Type of Shipment_x	AWB Code_x	Weight (kg)	slab rates	x_slab	Charged Weight	Zone_y	Billing Amount (Rs.)
0	2001806210	b	Forward charges	1091117221940	0.22	0.50	0.50	2.92	b	174.5
1	2001806226	d	Forward charges	1091117222065	0.24	1.25	1.25	0.68	d	90.2
2	2001806229	d	Forward charges	1091117222080	0.50	1.25	1.25	0.71	d	90.2
3	2001806232	d	Forward charges	1091117222124	0.38	1.25	1.25	1.30	d	135.0
4	2001806233	b	Forward charges	1091117222135	0.25	0.50	0.50	0.78	b	61.3

In [26]:
```
#giving conditons to if-else statements to fing y slab
l = []
for (i,r) in df1.iterrows():
    if r['slab rates'] >= r['Charged Weight']:
        l.append(r['slab rates'])
    elif r['slab rates'] * 2 >= r['Charged Weight']:
        l.append(r['slab rates'] *2)
    elif r['slab rates'] * 3 >= r['Charged Weight']:
        l.append(r['slab rates'] *3)
    elif r['slab rates'] * 4 >= r['Charged Weight']:
        l.append(r['slab rates'] *4)
    elif r['slab rates'] * 5 >= r['Charged Weight']:
        l.append(r['slab rates'] *5)
    elif r['slab rates'] * 6 >= r['Charged Weight']:
        l.append(r['slab rates'] *6)
    elif r['slab rates'] * 7 >= r['Charged Weight']:
        l.append(r['slab rates'] *7)
```

In [27]:
```
max(l)
```

Out[27]: 5.0

In [28]:
```
df1['y_slab'] =l
```

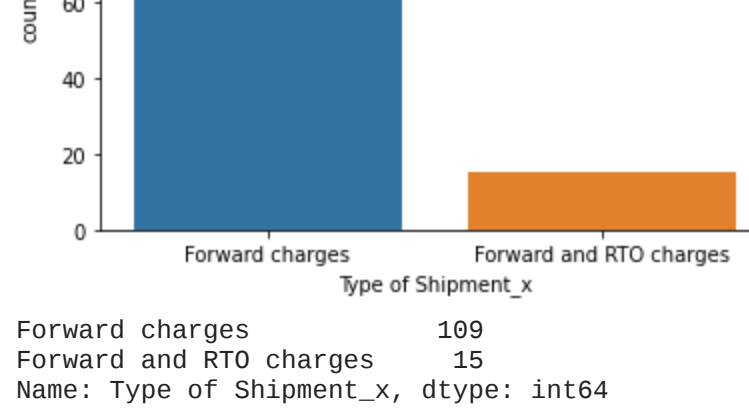
In [29]:
```
df1
```

Out[29]:

	Order ID	Zone_x	Type of Shipment_x	AWB Code_x	Weight (kg)	slab rates	x_slab	Charged Weight	Zone_y	Billing Amount (Rs.)	y_slab
0	2001806210	b	Forward charges	1091117221940	0.22	0.50	0.50	2.92	b	174.5	3.00
1	2001806226	d	Forward charges	1091117222065	0.24	1.25	1.25	0.68	d	90.2	1.25
2	2001806229	d	Forward charges	1091117222080	0.50	1.25	1.25	0.71	d	90.2	1.25
3	2001806232	d	Forward charges	1091117222124	0.38	1.25	1.25	1.30	d	135.0	2.50
4	2001806233	b	Forward charges	1091117222135	0.25	0.50	0.50	0.78	b	61.3	1.00
...	...	...	...	...	...	...	...	...	...	...	...
119	2001821995	d	Forward charges	1091121183730	0.48	1.25	1.25	0.50	d	45.4	1.25
120	2001822466	d	Forward charges	1091121305541	0.35	1.25	1.25	1.10	d	135.0	1.25
121	2001823564	d	Forward and RTO charges	1091121666133	0.33	1.25	1.25	0.70	d	172.8	1.25
122	2001825261	d	Forward and RTO charges	1091121981575	0.61	1.25	1.25	1.60	d	345.0	2.50
123	2001827036	b	Forward charges	1091122418320	2.04	0.50	2.50	1.60	b	117.9	2.00

124 rows × 11 columns

In [30]:
```
sns.countplot(x=df1['Type of Shipment_x'])
plt.show()
print(df1['Type of Shipment_x'].value_counts())
```




```
Forward charges            109
Forward and RTO charges     15
Name: Type of Shipment_x, dtype: int64
```

In [31]:
```
df1
```

Out[31]:

	Order ID	Zone_x	Type of Shipment_x	AWB Code_x	Weight (kg)	slab rates	x_slab	Charged Weight	Zone_y	Billing Amount (Rs.)	y_slab
0	2001806210	b	Forward charges	1091117221940	0.22	0.50	0.50	2.92	b	174.5	3.00
1	2001806226	d	Forward charges	1091117222065	0.24	1.25	1.25	0.68	d	90.2	1.25
2	2001806229	d	Forward charges	1091117222080	0.50	1.25	1.25	0.71	d	90.2	1.25
3	2001806232	d	Forward charges	1091117222124	0.38	1.25	1.25	1.30	d	135.0	2.50
4	2001806233	b	Forward charges	1091117222135	0.25	0.50	0.50	0.78	b	61.3	1.00
...	...	...	...	...	...	...	...	...	...	...	...
119	2001821995	d	Forward charges	1091121183730	0.48	1.25	1.25	0.50	d	45.4	1.25
120	2001822466	d	Forward charges	1091121305541	0.35	1.25	1.25	1.10	d	135.0	1.25
121	2001823564	d	Forward and RTO charges	1091121666133	0.33	1.25	1.25	0.70	d	172.8	1.25
122	2001825261	d	Forward and RTO charges	1091121981575	0.61	1.25	1.25	1.60	d	345.0	2.50
123	2001827036	b	Forward charges	1091122418320	2.04	0.50	2.50	1.60	b	117.9	2.00

124 rows × 11 columns

In [32]:
```
c_rates
```

Out[32]:

	Zone	Weight Slabs	Forward Fixed Charge	Forward Additional Weight Slab Charge	RTO Fixed Charge	RTO Additional Weight Slab Charge
0	A	0.25	29.5	23.6	13.6	23.6
1	B	0.50	33.0	28.3	20.5	28.3
2	C	0.75	40.1	38.9	31.9	38.9
3	D	1.25	45.4	44.8	41.3	44.8
4	E	1.50	56.6	55.5	50.7	55.5

In [33]:
```
#join rates dataframe to get all rates
df1 = df1.merge(c_rates,left_on='slab rates',right_on='Weight Slabs')
```

In [34]:
```
df1.drop(columns=['Zone','Weight Slabs'],inplace=True)
```

In [35]:
```
df1.head()
```

Out[35]:

	Order ID	Zone_x	Type of Shipment_x	AWB Code_x	Weight (kg)	slab rates	x_slab	Charged Weight	Zone_y	Billing Amount (Rs.)	y_slab	Forward Fixed Charge	Forward Additional Weight Slab Charge	RTO Fixed Charge	RTO Additional Weight Slab Charge
0	2001806210	b	Forward charges	1091117221940	0.22	0.5	0.5	2.92	b	174.5	3.0	33.0	28.3	20.5	28.3
1	2001806233	b	Forward charges	1091117222135	0.25	0.5	0.5	0.78	b	61.3	1.0	33.0	28.3	20.5	28.3
2	2001806458	b	Forward charges	1091117223244	0.70	0.5	1.0	1.00	b	61.3	1.0	33.0	28.3	20.5	28.3
3	2001806547	b	Forward charges	1091117224611	0.13	0.5	0.5	1.00	b	61.3	1.0	33.0	28.3	20.5	28.3
4	2001806575	b	Forward charges	1091117225016	0.50	0.5	0.5	0.68	b	61.3	1.0	33.0	28.3	20.5	28.3

In [36]:
```
#for calculating company expected charge
l = []
for (i,r) in df1.iterrows():
    if np.round(r['Weight (kg)']/r['x_slab']) == 0 and r['Type of Shipment_x']=='Forward charges':
        l.append(r['Forward Fixed Charge'])
    elif np.round(r['Weight (kg)']/r['x_slab']) > 0 and r['Type of Shipment_x']=='Forward charges':
        l.append(r['Forward Fixed Charge'] + r['Forward Additional Weight Slab Charge']*(r['Weight (kg)']/r['x_slab'] - 1))
    elif np.round(r['Weight (kg)']/r['x_slab']) == 0 and r['Type of Shipment_x']=='Forward and RTO charges':
        l.append(r['Forward Fixed Charge']+r['RTO Fixed Charge'])
    elif np.round(r['Weight (kg)']/r['x_slab']) > 0 and r['Type of Shipment_x']=='Forward and RTO charges':
        l.append(r['RTO Fixed Charge']+r['Forward Fixed Charge']+ r['RTO Additional Weight Slab Charge']*(r['Weight (kg)']/r['x_slab'] - 1))
```

In [37]:
```
l = np.round(l,decimals=1)
```

In [38]:
```
df1['Expected Charge x'] = l
```

In [39]:
```
df1.head()
```

Out[39]:

	Order ID	Zone_x	Type of Shipment_x	AWB Code_x	Weight (kg)	slab rates	x_slab	Charged Weight	Zone_y	Billing Amount (Rs.)	y_slab	Forward Fixed Charge	Forward Additional Weight Slab Charge	RTO Fixed Charge	RTO Additional Weight Slab Charge	Expected Charge x
0	2001806210	b	Forward charges	1091117221940	0.22	0.5	0.5	2.92	b	174.5	3.0	33.0	28.3	20.5	28.3	33.0
1	2001806233	b	Forward charges	1091117222135	0.25	0.5	0.5	0.78	b	61.3	1.0	33.0	28.3	20.5	28.3	33.0
2	2001806458	b	Forward charges	1091117223244	0.70	0.5	1.0	1.00	b	61.3	1.0	33.0	28.3	20.5	28.3	24.5
3	2001806547	b	Forward charges	1091117224611	0.13	0.5	0.5	1.00	b	61.3	1.0	33.0	28.3	20.5	28.3	33.0
4	2001806575	b	Forward charges	1091117225016	0.50	0.5	0.5	0.68	b	61.3	1.0	33.0	28.3	20.5	28.3	33.0

In [40]:
```
#droping unwanted columns
df1.drop(columns=['slab rates','Type of Shipment_x','Forward Fixed Charge',
                  'Forward Additional Weight Slab Charge','RTO Fixed Charge',
                  'RTO Additional Weight Slab Charge'],inplace=True)
```

In [41]:
```
df1.head()
```

Out[41]:

	Order ID	Zone_x	AWB Code_x	Weight (kg)	x_slab	Charged Weight	Zone_y	Billing Amount (Rs.)	y_slab	Expected Charge x
0	2001806210	b	1091117221940	0.22	0.5	2.92	b	174.5	3.0	33.0
1	2001806233	b	1091117222135	0.25	0.5	0.78	b	61.3	1.0	33.0
2	2001806458	b	1091117223244	0.70	1.0	1.00	b	61.3	1.0	24.5
3	2001806547	b	1091117224611	0.13	0.5	1.00	b	61.3	1.0	33.0
4	2001806575	b	1091117225016	0.50	0.5	0.68	b	61.3	1.0	33.0

In [42]:
```
#calculating difference between conpany x charge and courier company charge
df1['Difference_billind_enpected'] = df1['Billing Amount (Rs.)']-df1['Expected Charge x']
```

In [43]:
```
df1.head()
```

Out[43]:

	Order ID	Zone_x	AWB Code_x	Weight (kg)	x_slab	Charged Weight	Zone_y	Billing Amount (Rs.)	y_slab	Expected Charge x	Difference_billind_enpected
0	2001806210	b	1091117221940	0.22	0.5	2.92	b	174.5	3.0	33.0	141.5
1	2001806233	b	1091117222135	0.25	0.5	0.78	b	61.3	1.0	33.0	28.3
2	2001806458	b	1091117223244	0.70	1.0	1.00	b	61.3	1.0	24.5	36.8
3	2001806547	b	1091117224611	0.13	0.5	1.00	b	61.3	1.0	33.0	28.3
4	2001806575	b	1091117225016	0.50	0.5	0.68	b	61.3	1.0	33.0	28.3

In [44]:
```
#rename columns name
df1.rename({'AWB Code_x':'AWB Code','Weight (kg)':'X Total wight','x_slab':'X weight slab',
           'Charged Weight':'C Total wight','y_slab':'C weight slab','Zone_y':'Zone_c',
           'Billing Amount (Rs.)':'Charges Billed by C',
           'Difference_billind_enpected':'Diff C & X'},axis=1, inplace=True)
```

In [45]:
```
df1.head()
```

Out[45]:

	Order ID	Zone_x	AWB Code	X Total wight	X weight slab	C Total wight	Zone_c	Charges Billed by C	C weight slab	Expected Charge x	Diff C & X
0	2001806210	b	1091117221940	0.22	0.5	2.92	b	174.5	3.0	33.0	141.5
1	2001806233	b	1091117222135	0.25	0.5	0.78	b	61.3	1.0	33.0	28.3
2	2001806458	b	1091117223244	0.70	1.0	1.00	b	61.3	1.0	24.5	36.8
3	2001806547	b	1091117224611	0.13	0.5	1.00	b	61.3	1.0	33.0	28.3
4	2001806575	b	1091117225016	0.50	0.5	0.68	b	61.3	1.0	33.0	28.3

In [46]:
```
#for rearange columns
columns = ['Order ID','AWB Code','X Total wight','X weight slab','C Total wight','C weight slab',
          'Zone_x','Zone_c','Expected Charge x','Charges Billed by C','Diff C & X']
```

In [47]:
```
company_x = df1[columns]
```

In [48]:
```
company_x.head()
```

Out[48]:

	Order ID	AWB Code	X Total wight	X weight slab	C Total wight	C weight slab	Zone_x	Zone_c	Expected Charge x	Charges Billed by C	Diff C & X
0	2001806210	1091117221940	0.22	0.5	2.92	3.0	b	b	33.0	174.5	141.5
1	2001806233	1091117222135	0.25	0.5	0.78	1.0	b	b	33.0	61.3	28.3
2	2001806458	1091117223244	0.70	1.0	1.00	1.0	b	b	24.5	61.3	36.8
3	2001806547	1091117224611	0.13	0.5	1.00	1.0	b	b	33.0	61.3	28.3
4	2001806575	1091117225016	0.50	0.5	0.68	1.0	b	b	33.0	61.3	28.3

In [49]:
```
company_x.to_csv('companyX')
```

In [ ]: