Data visualization in Python

BY BHAGYASHREE CHAVAN

Goal and Task

- ‘Amazing Mart’ data set with 15 European countries contain 4 year that is 2011 to 2014 of information.
- Analysis of this data set with total count of order place in year.
- Month wise how many order has been placed in specific year?

Library Use

DS 620Project_Amazing Mart -

localhost:8889/notebooks/Desktop/DS%20620Project_Amazing%20Mart.ipynb#Amazing-Mart

Apps Google Tables https://www.tutoria... https://www.tutoria... https://www.tutoria... https://ehmatthes.... GitHub - awesome... https://www.tutoria...

jupyter DS 620Project_Amazing Mart Last Checkpoint: 12 minutes ago (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

Run Code

Project in Data Visualization

Amazing Mart in EU

In [120]:
```
# These are the following Library using to get our results

import pandas as pd

import matplotlib

import matplotlib.pyplot as plt
import numpy as np
import seaborn as sns
%matplotlib inline
```

In [121]:
```
# to get know what is our path
import pathlib
pathlib.Path().absolute()
```

Out[121]:
```
PosixPath('/Users/bhagyashreechavan/Desktop')
```

In [122]:
```
# reading file

df = pd.read_csv('AmazingMartEU2.csv',encoding='latin1')
df
```

Out[122]:

	sr_no	Order_ID	Order Date	Customer_Name	City	Country	Region	Segment	Category	Sub-Category	Ship-Mode
0	1	BN-2011-7407039	1/1/11	Ruby Patel	Stockholm	Sweden	North	Home Office	Office Supplies	Paper	Economy Plus
1	2	AZ-2011-9050313	1/3/11	Summer Hayward	Southport	United Kingdom	North	Consumer	Furniture	Bookcases	Economy

Reading File

DS 620Project_Amazing Mart -

localhost:8889/notebooks/Desktop/DS%20620Project_Amazing%20Mart.ipynb#Amazing-Mart

Apps Google Tables https://www.tutoria... https://www.tutoria... https://www.tutoria... https://ehmatthes.... GitHub - awesome... https://www.tutoria...

jupyter DS 620Project_Amazing Mart Last Checkpoint: 13 minutes ago (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

Run Code

In [122]:
```
# reading file

df = pd.read_csv('AmazingMartEU2.csv',encoding='latin1')
df
```

Out[122]:

	sr_no	Order_ID	Order Date	Customer_Name	City	Country	Region	Segment	Category	Sub-Category	Ship-Mode
0	1	BN-2011-7407039	1/1/11	Ruby Patel	Stockholm	Sweden	North	Home Office	Office Supplies	Paper	Economy Plus
1	2	AZ-2011-9050313	1/3/11	Summer Hayward	Southport	United Kingdom	North	Consumer	Furniture	Bookcases	Economy
2	3	AZ-2011-6674300	1/4/11	Devin Huddleston	Valence	France	Central	Consumer	Office Supplies	Art	Economy
3	4	BN-2011-2819714	1/4/11	Mary Parker	Birmingham	United Kingdom	North	Corporate	Office Supplies	Art	Economy
4	5	AZ-2011-617423	1/5/11	Daniel Burke	Echirolles	France	Central	Home Office	Office Supplies	Storage	Priority
...	...	...	...	...	...	...	...	...	...	...	...
4112	4113	AZ-2014-8174835	12/31/14	Eloise Sykes	Bielefeld	Germany	Central	Consumer	Office Supplies	Paper	Economy
4113	4114	AZ-2014-766953	12/31/14	Jose Gambino	Maidenhead	United Kingdom	North	Corporate	Office Supplies	Art	Economy
4114	4115	AZ-2014-1412225	12/31/14	Leon Barnes	Worcester	United Kingdom	North	Consumer	Office Supplies	Art	Priority
4115	4116	AZ-2014-7604524	12/31/14	Rebecca Chamberlain	Hamburg	Germany	Central	Home Office	Office Supplies	Supplies	Economy
4116	4117	BN-2014-4140795	12/31/14	Daniel Hamilton	Eindhoven	Netherlands	Central	Home Office	Technology	Phones	Economy Plus

4117 rows × 11 columns

In [123]:
```
# checking head of data set
df.head()
```

Out[123]:

	sr_no	Order_ID	Order Date	Customer_Name	City	Country	Region	Segment	Category	Sub-Category	Ship-Mode
0	1	BN-2011-7407039	1/1/11	Ruby Patel	Stockholm	Sweden	North	Home Office	Office Supplies	Paper	Economy Plus

Understanding of Data

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

Run Code

In [123]:
```
# checking head of data set
df.head()
```

Out[123]:

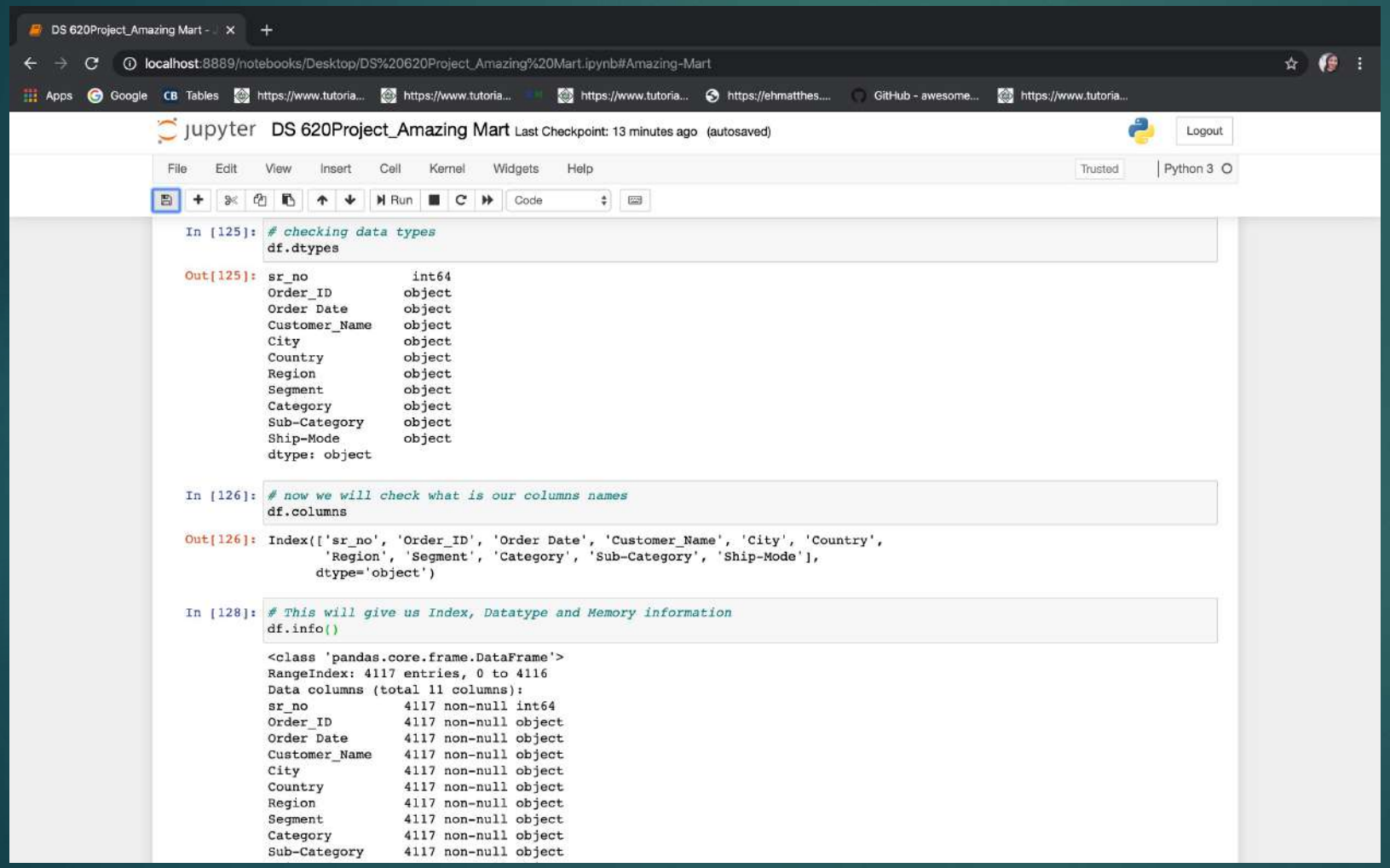
	sr_no	Order_ID	Order Date	Customer_Name	City	Country	Region	Segment	Category	Sub-Category	Ship-Mode
0	1	BN-2011-7407039	1/1/11	Ruby Patel	Stockholm	Sweden	North	Home Office	Office Supplies	Paper	Economy Plus
1	2	AZ-2011-9050313	1/3/11	Summer Hayward	Southport	United Kingdom	North	Consumer	Furniture	Bookcases	Economy
2	3	AZ-2011-6674300	1/4/11	Devin Huddleston	Valence	France	Central	Consumer	Office Supplies	Art	Economy
3	4	BN-2011-2819714	1/4/11	Mary Parker	Birmingham	United Kingdom	North	Corporate	Office Supplies	Art	Economy
4	5	AZ-2011-617423	1/5/11	Daniel Burke	Echirolles	France	Central	Home Office	Office Supplies	Storage	Priority

In [124]:
```
# here we will get tail of the data with columns name
df.tail()
```

Out[124]:

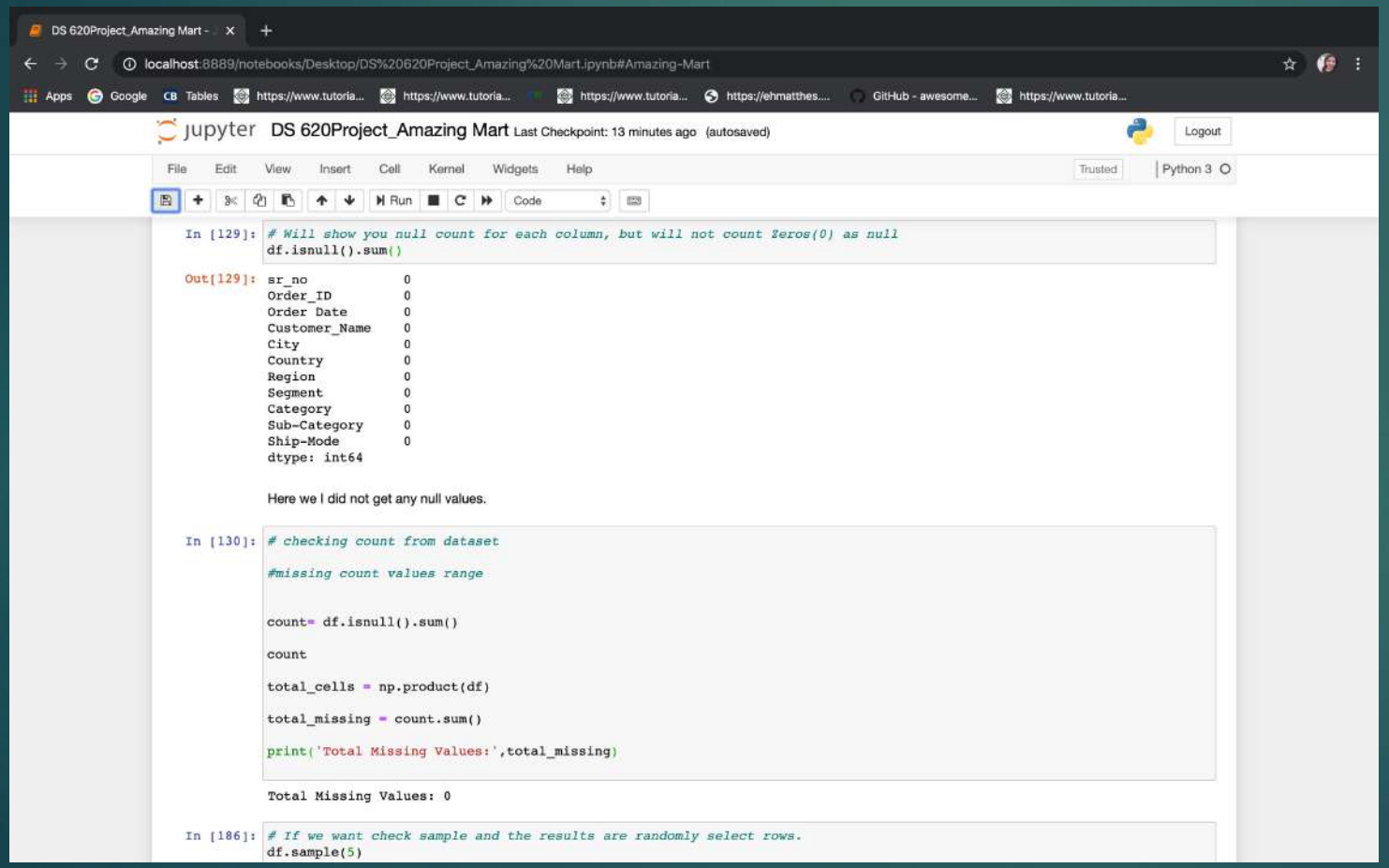
	sr_no	Order_ID	Order Date	Customer_Name	City	Country	Region	Segment	Category	Sub-Category	Ship-Mode
4112	4113	AZ-2014-8174835	12/31/14	Eloise Sykes	Bielefeld	Germany	Central	Consumer	Office Supplies	Paper	Economy
4113	4114	AZ-2014-766953	12/31/14	Jose Gambino	Maidenhead	United Kingdom	North	Corporate	Office Supplies	Art	Economy
4114	4115	AZ-2014-1412225	12/31/14	Leon Barnes	Worcester	United Kingdom	North	Consumer	Office Supplies	Art	Priority
4115	4116	AZ-2014-7604524	12/31/14	Rebecca Chamberlain	Hamburg	Germany	Central	Home Office	Office Supplies	Supplies	Economy
4116	4117	BN-2014-4140795	12/31/14	Daniel Hamilton	Eindhoven	Netherlands	Central	Home Office	Technology	Phones	Economy Plus

Understanding of Data



- **Understating data of type, columns name or features in dataset.**
- **Info() code represents information about dataset.**

Missing Values



In data set after doing analysis, there is no Missing value in data.

Adding More Columns

DS 620Project_Amazing Mart

localhost:8889/notebooks/Desktop/DS%20620Project_Amazing%20Mart.ipynb#Amazing-Mart

jupyter DS 620Project_Amazing Mart Last Checkpoint: 13 minutes ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help

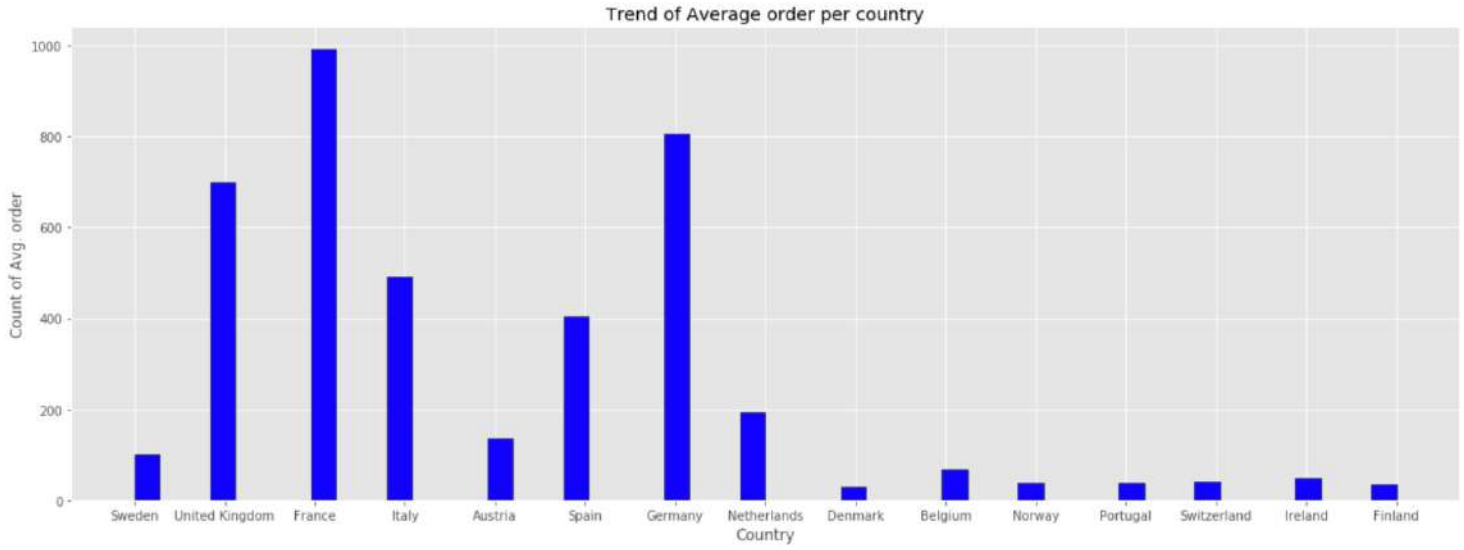
```
In [132]: #Slipting order date column
          df['Year']=pd.to_datetime(df['Order Date']).apply(lambda x:x.year)

In [133]: #Slipting order date column
          df['Month']=pd.to_datetime(df['Order Date']).apply(lambda x:x.month)

In [134]: #Slipting order date column
          df['Day']=pd.to_datetime(df['Order Date']).apply(lambda x:x.day)

In [135]: # For checking result
          df.head(20)

Out[135]:
```

	sr_no	Order_ID	Order Date	Customer_Name	City	Country	Region	Segment	Category	Sub-Category	Ship-Mode	Year	Month	Day
0	1	BN-2011-7407039	1/1/11	Ruby Patel	Stockholm	Sweden	North	Home Office	Office Supplies	Paper	Economy Plus	2011	1	1
1	2	AZ-2011-9050313	1/3/11	Summer Hayward	Southport	United Kingdom	North	Consumer	Furniture	Bookcases	Economy	2011	1	3
2	3	AZ-2011-6674300	1/4/11	Devin Huddleston	Valence	France	Central	Consumer	Office Supplies	Art	Economy	2011	1	4
3	4	BN-2011-2819714	1/4/11	Mary Parker	Birmingham	United Kingdom	North	Corporate	Office Supplies	Art	Economy	2011	1	4
4	5	AZ-2011-617423	1/5/11	Daniel Burke	Echirolles	France	Central	Home Office	Office Supplies	Storage	Priority	2011	1	5
5	6	AZ-2011-2918397	1/7/11	Fredrick Beveridge	La Seyne-sur-Mer	France	Central	Corporate	Office Supplies	Art	Priority	2011	1	7
6	7	BN-2011-3248724	1/8/11	Archer Hort	Toulouse	France	Central	Consumer	Office Supplies	Art	Economy	2011	1	8
7	8	AZ-2011-6712797	1/11/11	Evie Flockhart	Genoa	Italy	South	Consumer	Furniture	Bookcases	Economy	2011	1	11
8	9	AZ-2011-4827146	1/11/11	Faith Greenwood	Vienna	Austria	Central	Consumer	Office Supplies	Fasteners	Economy	2011	1	11

- **3 more columns added during analysis for further depth investigation.**

Country Wise Order

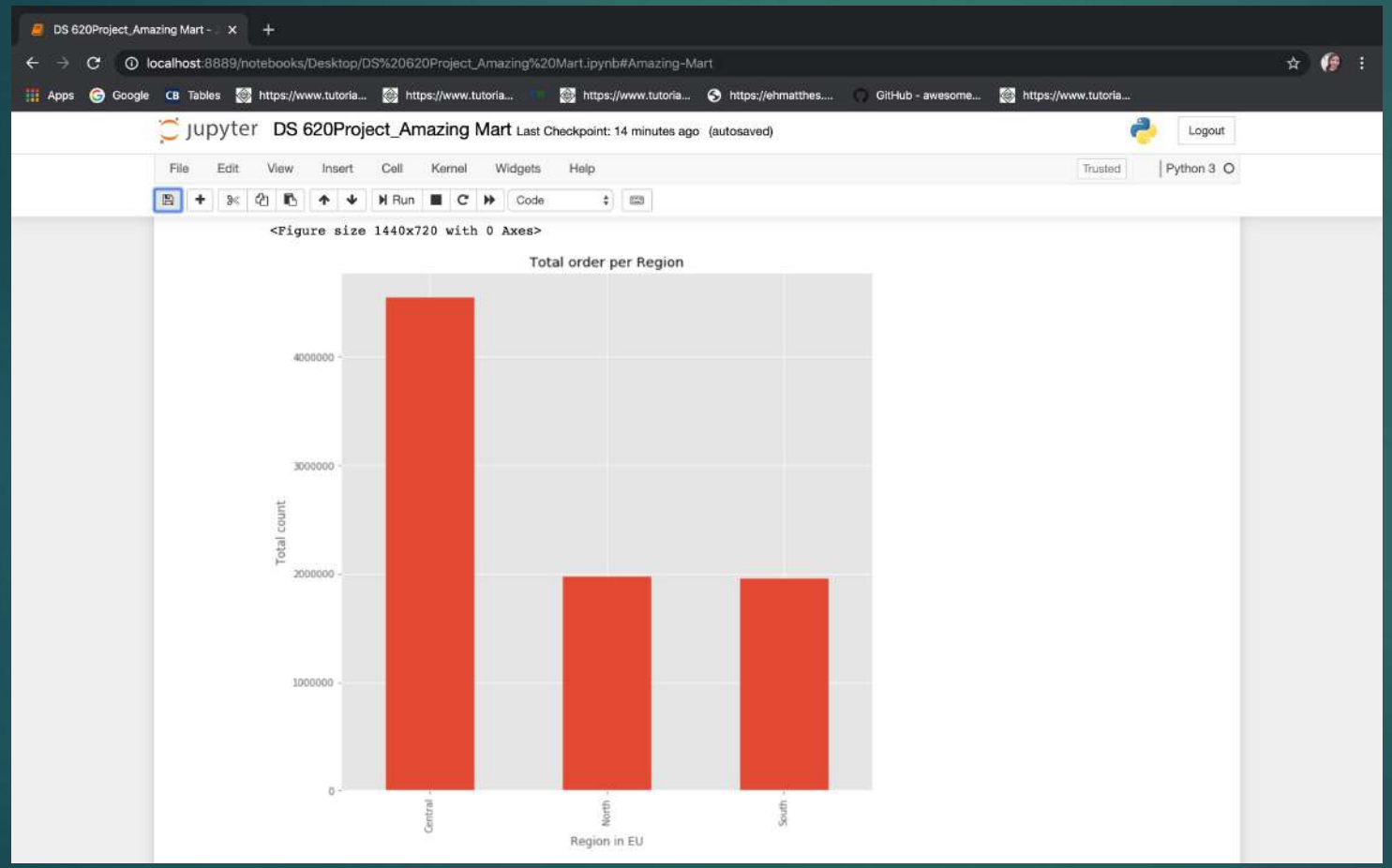
```
In [173]: import matplotlib.pyplot as plt
          import seaborn as sns

          #creating histogram

          plt.figure()
          plt.figure(figsize=(20,7))
          plt.hist(df['Country'],color = 'blue', edgecolor = 'black', bins= 50)
          plt.style.use('ggplot')
          plt.title('Trend of Average order per country')
          plt.xlabel('Country')
          plt.ylabel('Count of Avg. order')
          plt.show()

<Figure size 1440x720 with 0 Axes>
```




```
In [188]: # creating Bar plot with Using ggplot style
```

- Histogram of country wise order.
- ggplot plot style for the graph
- In result France, U.K , Germany order the most, while comparing others.

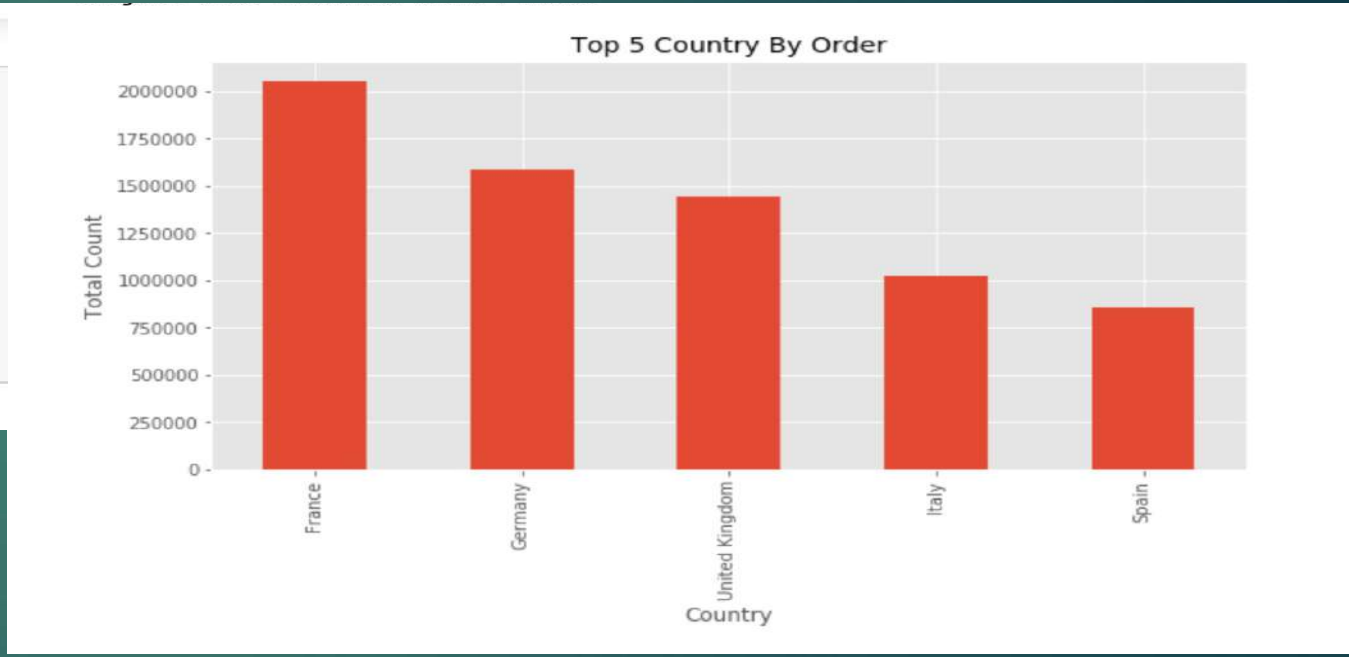
Region Wise Analysis



In result it shows that Central part of Europe order most.

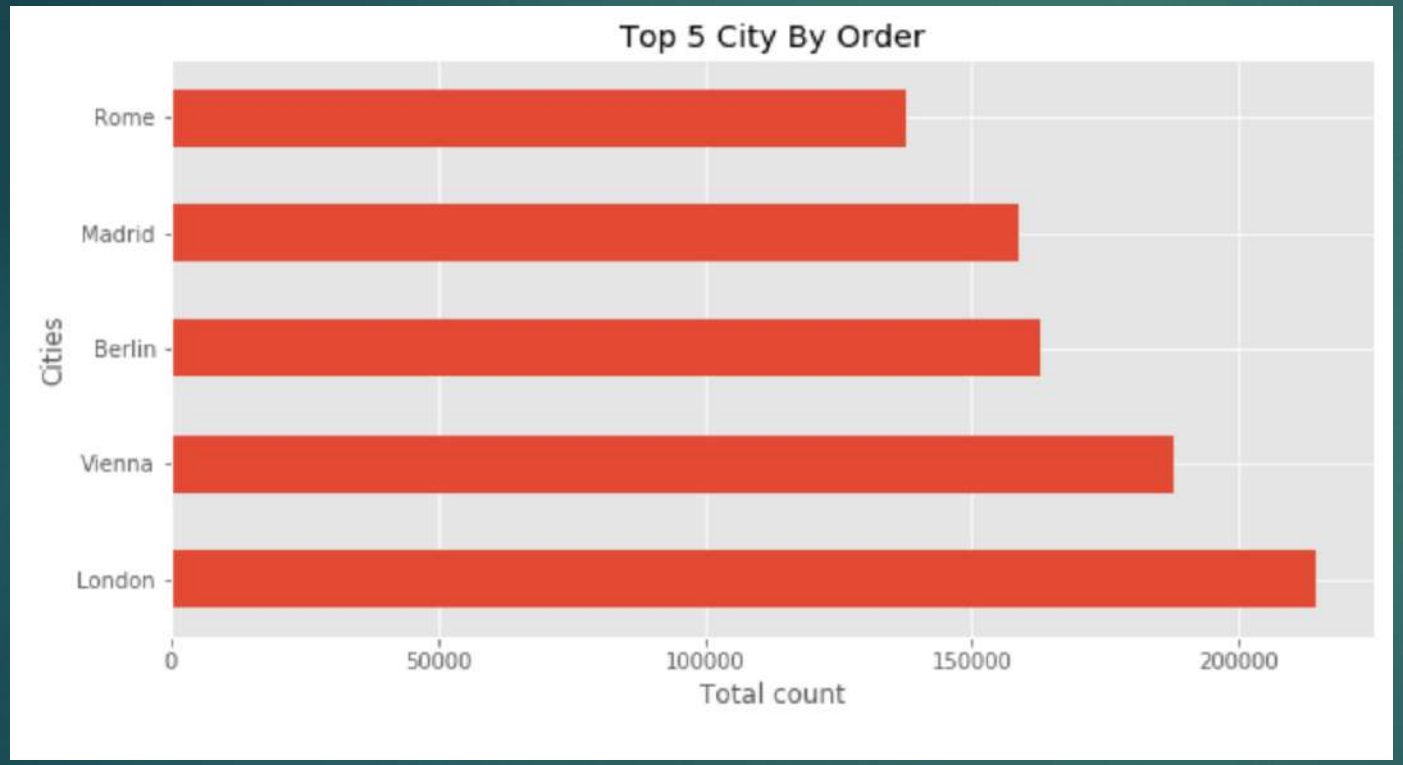
Top 5 Country wise

```
In [190]: # creating bar plot with top 5 values with ascending order
          plt.figure()
          plt.figure(figsize=(10,5))
          df.groupby("Country").sr_no.sum().sort_values(ascending=False)[:5].plot.bar()
          plt.title('Top 5 Country By Order')
          plt.xlabel('Country')
          plt.ylabel('Total Count')
          plt.show()

          <Figure size 1440x720 with 0 Axes>
```



In result France, Germany, UK, Italy and Spain order most as comparing to other.

Top 5 City order



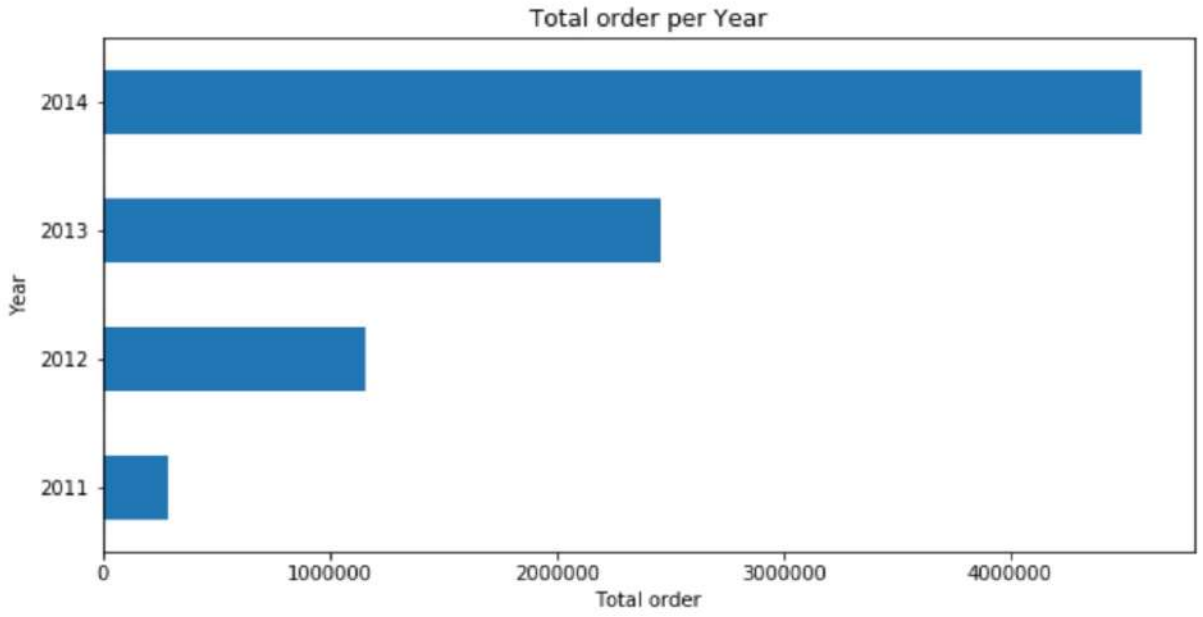
City wise London, Vienna, Berlin, Madrid and Rome ordered most

Best Month and Days

Best month is December and Best day is 26 in whole year.

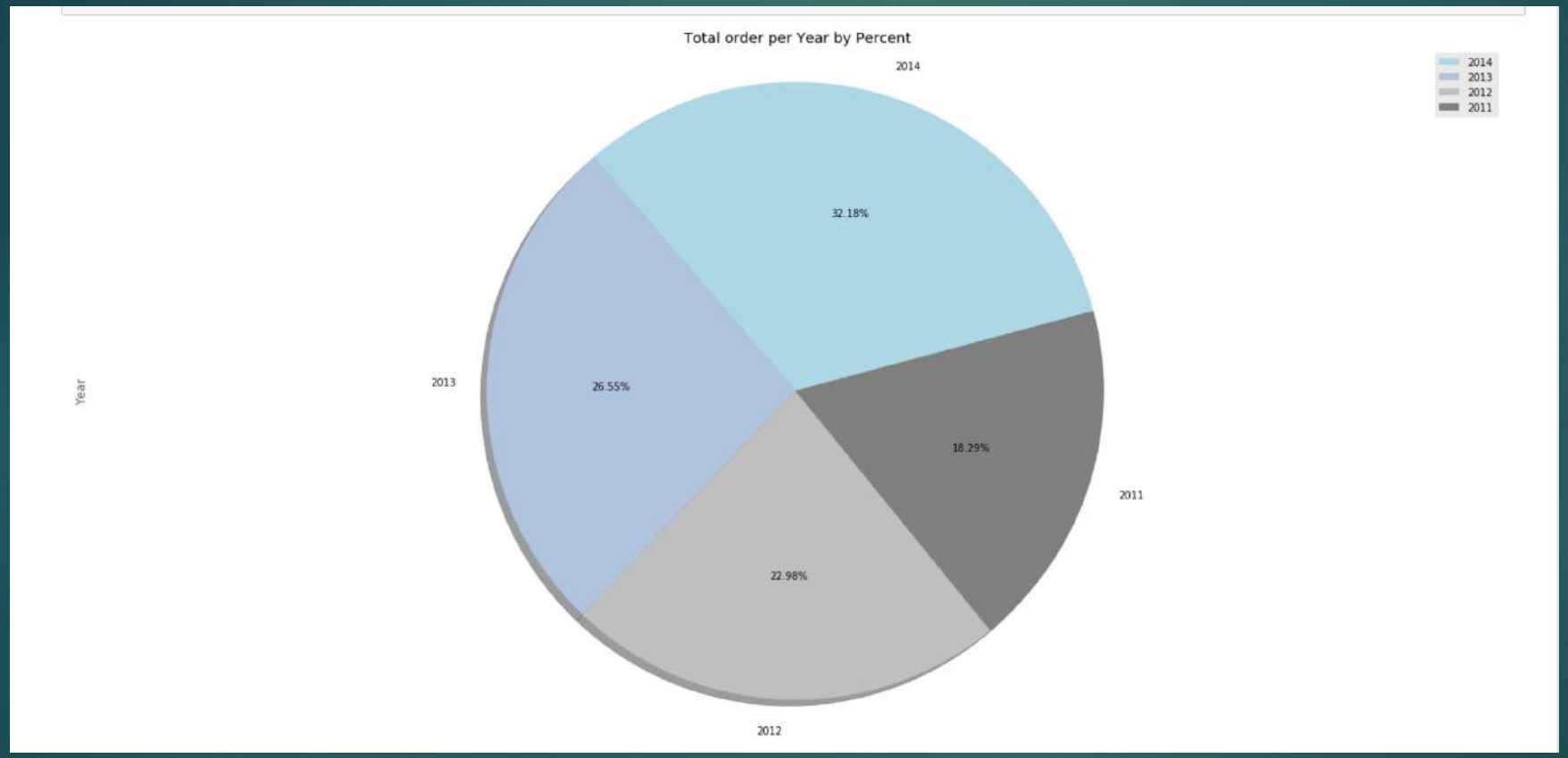
Yearly ordered

```
In [143]: plt.figure()
          plt.figure(figsize=(10,5))
          df.groupby('Year').sr_no.sum().plot.barh()
          plt.title('Total order per Year')
          plt.xlabel('Total order')
          plt.ylabel('Year')
          plt.show()

<Figure size 432x288 with 0 Axes>
```



Comparing 2011 to 2014 order has been increased.

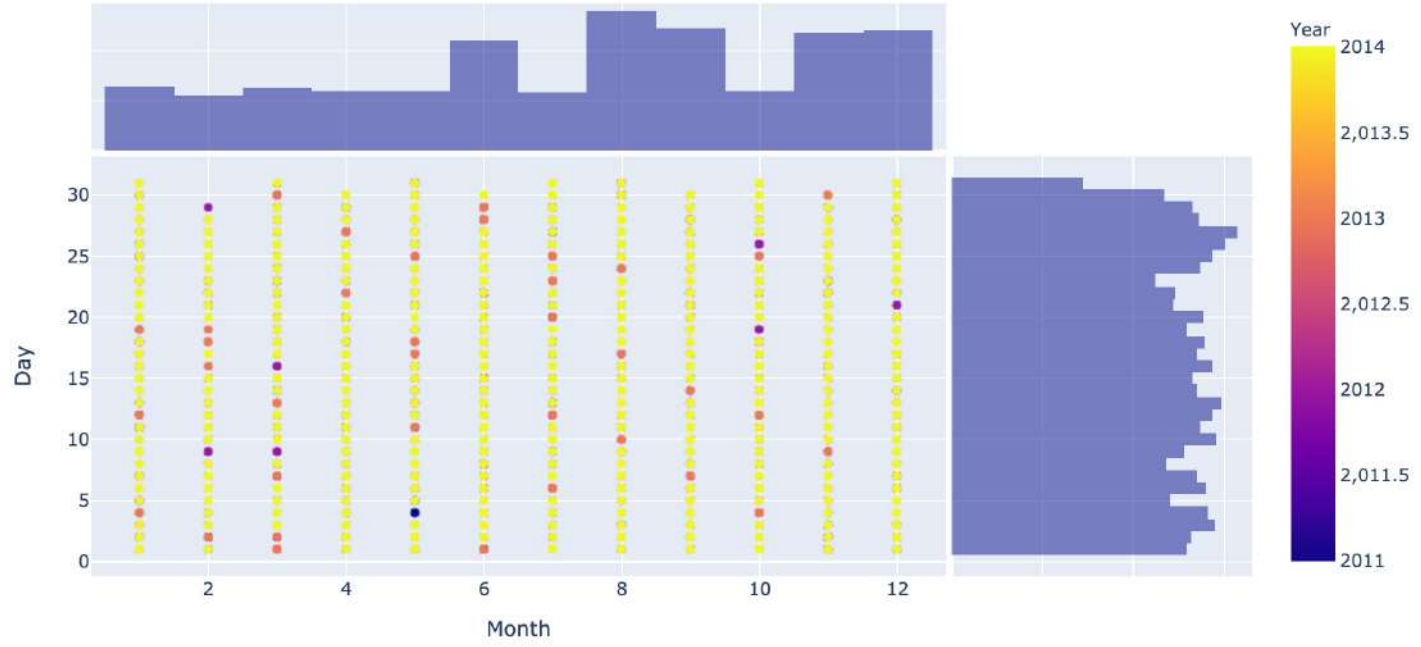
Yearly Order in Percent %



In 2014 32.18% order are the most comparing rest of years.

Segment Analysis

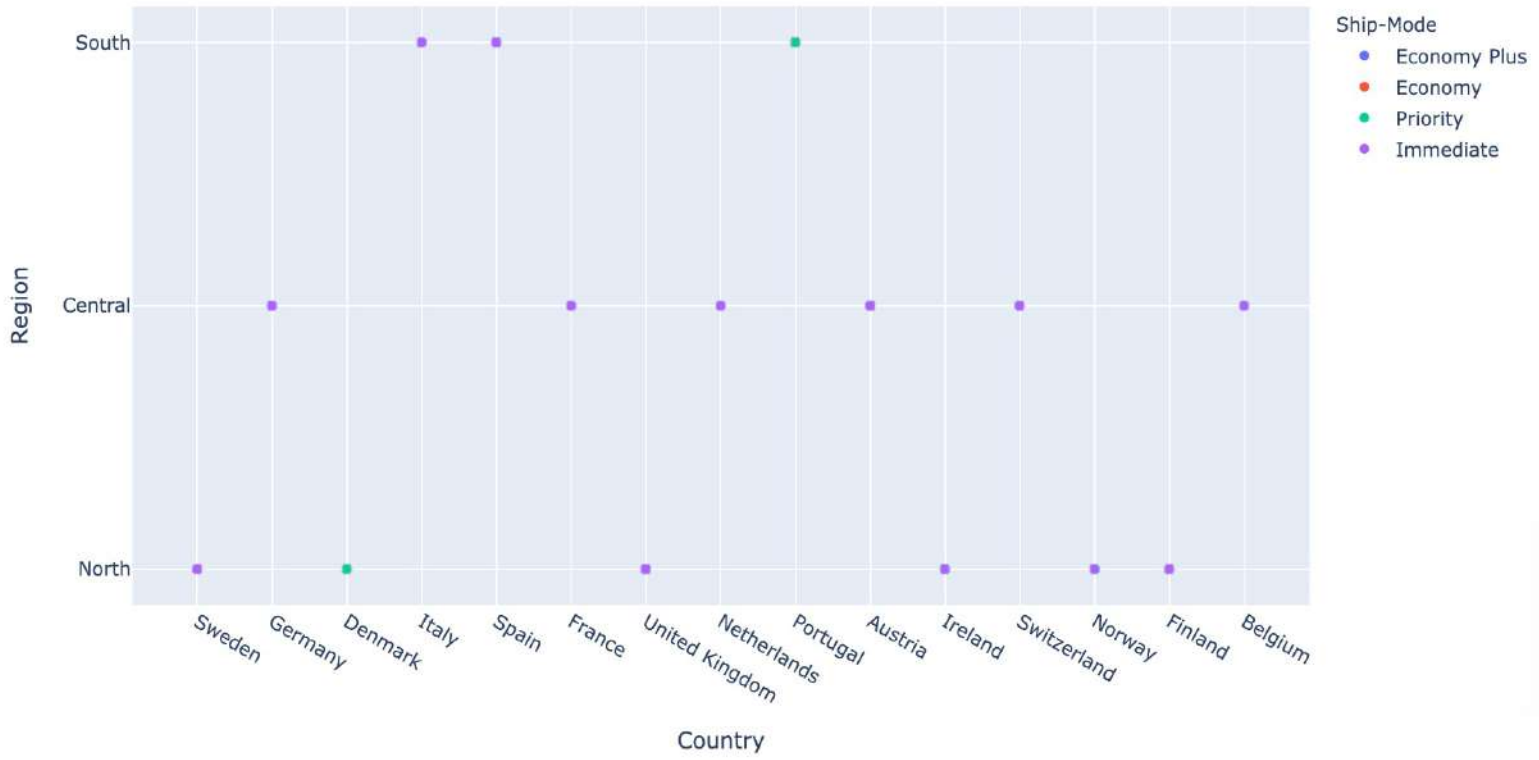
```
In [145]: # Scatter plot with histogram

          import plotly_express as px

          px.scatter(df, x = 'Month', y = 'Day', color = 'Year',marginal_y="histogram", marginal_x="histogram")
```



In this analysis graphs has shown count of order month and day wise.

Segment Analysis

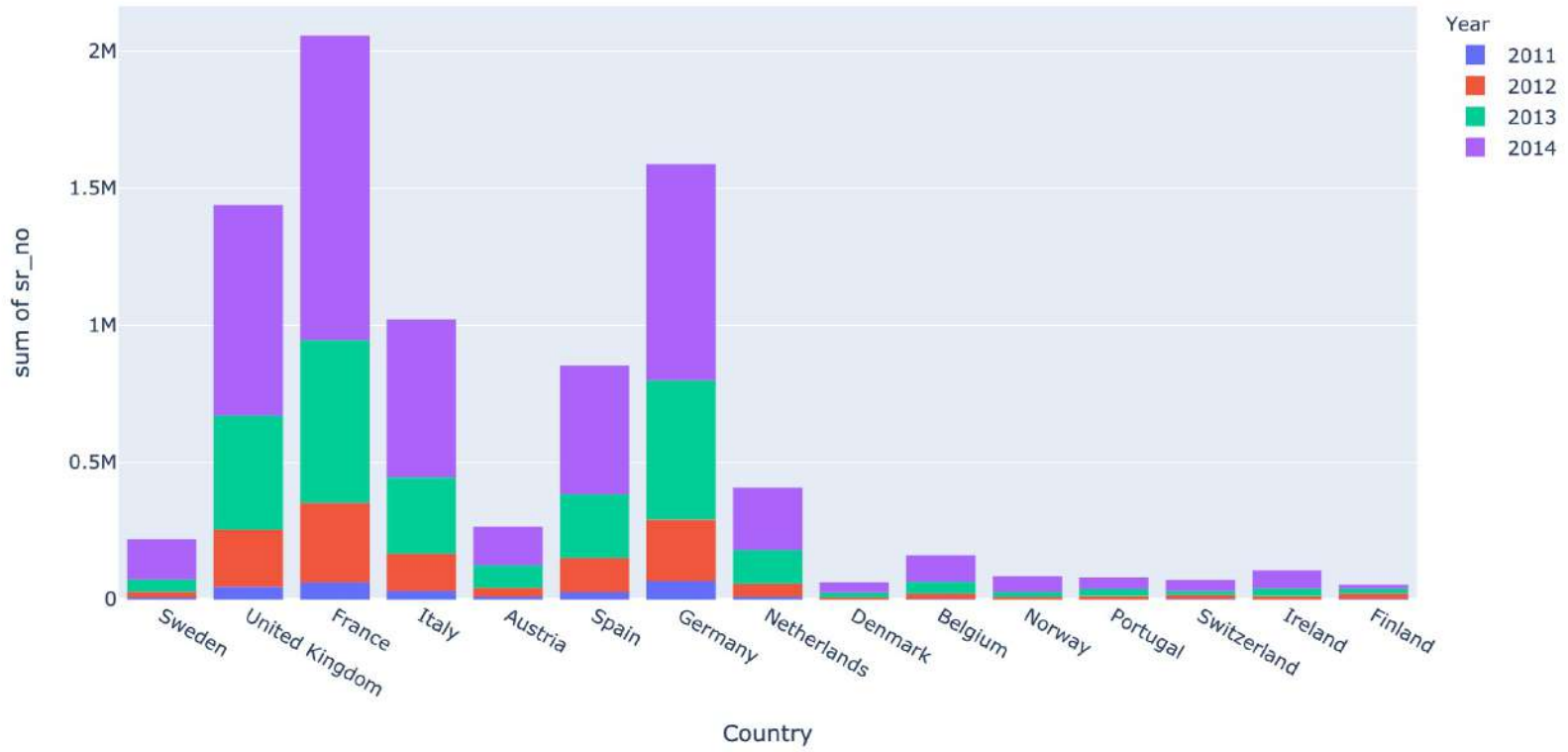
```
In [144]: # creating scatter plot with plotly library
          import plotly_express as px

          px.scatter(df, x = 'Country', y = 'Region', color = 'Ship-Mode')
```



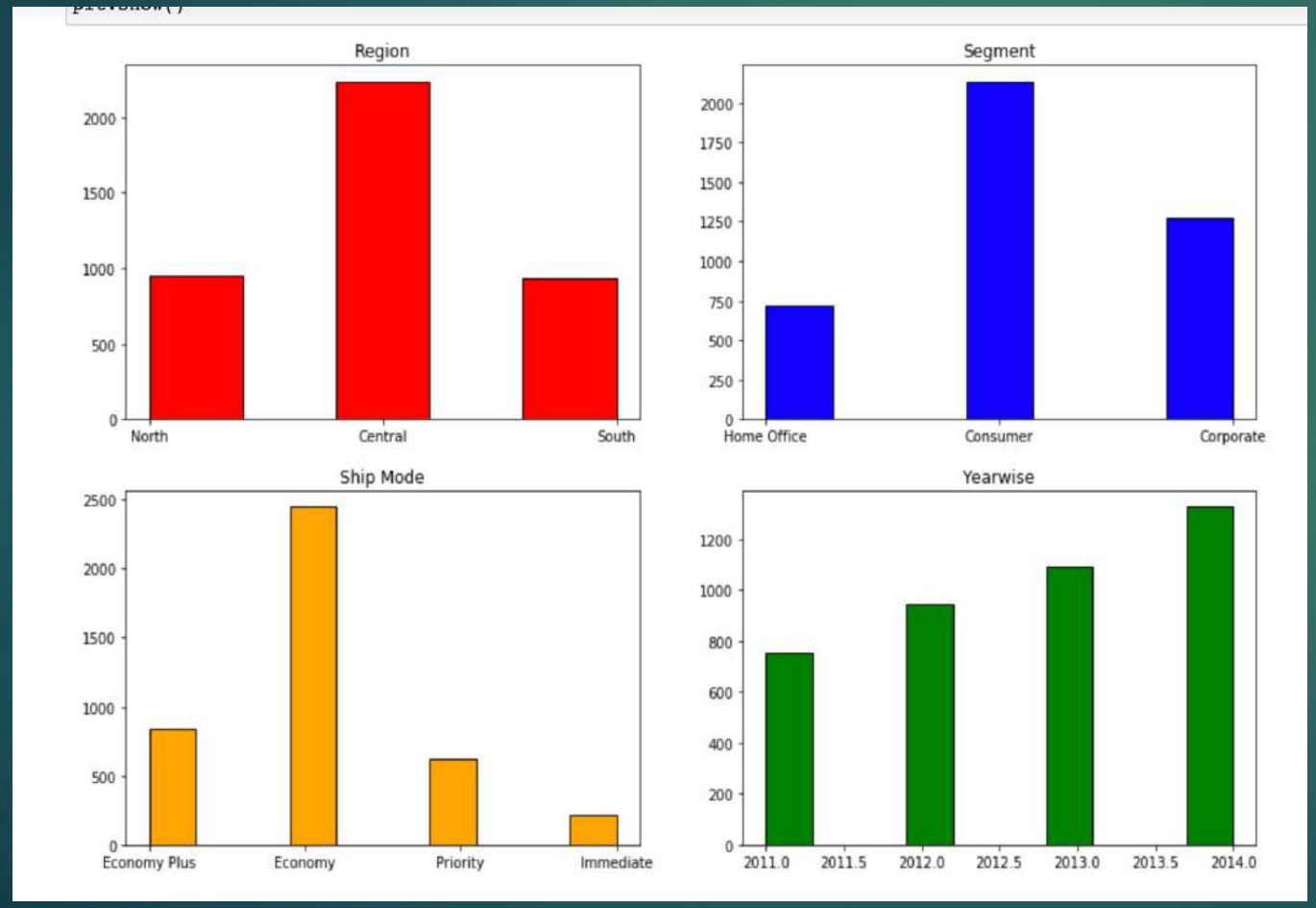
People are mostly preferred Economy shipping mode. In only south region of Europe Portugal has ordered at priority base.

Segment Analysis

```
In [146]: # created graph with plotly with 3 category
          px.histogram(df, x = 'Country', y = 'sr_no', histfunc = 'sum', color = 'Year')
```



Segment Analysis




```python
import matplotlib.pyplot as plt
import seaborn as sns


#creating histogram subplots

fig,ax = plt.subplots(2,2, figsize=(15,10))
ax[0,0].hist(df['Region'], color = 'red', edgecolor = 'black', bins= 5)
ax[0,0].set_title('Region')
ax[0,1].hist(df['Segment'], color = 'blue',edgecolor = 'black', bins= 7)
ax[0,1].set_title('Segment')
ax[1,0].hist(df['Ship-Mode'], color = 'orange',edgecolor = 'black', bins= 10)
ax[1,0].set_title('Ship Mode')
ax[1,1].hist(df['Year'], color = 'green', edgecolor = 'black', bins= 10)
ax[1,1].set_title('Yearwise')
plt.show()
```

Conclusion

- In Europe best region is central and if company want to grow their profit they need to focus on north and south region equally.
- In segment section Consumer are doing well but company has low orders from home office. they need to improve this section as well for better order in future.
- In ship mode people Prefer more economy mode than immediate.
- In France and UK are doing well but rest of country need attention.
- In Year wise order are increasing but for more profit and more orders company need to focus on other part like Segment and shipment as well.

Thank You