```
print("Welcome to Python Automation using ETL process")

Welcome to Python Automation using ETL process

import numpy as np
import pandas as pd
import matplotlib as plt
```

#Extract the Data from Flat File

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

df.head(3)

   row         orderid   orderdate ordermonth   ship_date  delay  \
0    1  CA-2016-152156  08-11-2016        Nov  11-11-2016      3   
1    2  CA-2016-152156  08-11-2016        Nov  11-11-2016      3   
2    3  CA-2016-138688  12-06-2016        Jun  16-06-2016      4   

      ship_mode   cust_id        cust_name    segment  ...  
category  \
0  Second Class  CG-12520      Claire Gute   Consumer  ...  
Furniture   
1  Second Class  CG-12520      Claire Gute   Consumer  ...  
Furniture   
2  Second Class  DV-13045  Darrin Van Huff  Corporate  ...  Office 
Supplies   

  sub_category                                       product_name  
sales  \
0    Bookcases                  Bush Somerset Collection Bookcase 
261.96   
1       Chairs  Hon Deluxe Fabric Upholstered Stacking Chairs,... 
731.94   
2       Labels  Self-Adhesive Address Labels for Typewriters b...  
14.62   

  quantity discount    profit Unnamed: 23 Unnamed: 24  Unnamed: 25  
0      2.0      0.0   41.9136         NaN         NaN          NaN  
1      3.0      0.0  219.5820         NaN         NaN          NaN  
2      2.0      0.0    6.8714         NaN         NaN          NaN  

[3 rows x 26 columns]

df.tail(3)

        row         orderid   orderdate ordermonth   ship_date  delay 
\
10207  8323  CA-2016-130778  19-11-2016        Nov  25-11-2016      6   

10208  8324  CA-2016-130778  19-11-2016        Nov  25-11-2016      6   
```

```
10209  8325  CA-2017-144456  08-09-2017       Sep  09-09-2017      1


            ship_mode   cust_id          cust_name
segment  ...  \
10207  Standard Class  ND-18370  Natalie DeCherney     Consumer  ...

10208  Standard Class  ND-18370  Natalie DeCherney     Consumer  ...

10209     First Class  FC-14245     Frank Carlisle  Home Office  ...


              category sub_category  \
10207  Office Supplies   Appliances
10208  Office Supplies        Paper
10209  Office Supplies      Storage

                                            product_name  sales
quantity  \
10207                Disposable Triple-Filter Dust Bags   8.74
2.0
10208  Recycled Desk Saver Line "While You Were Out" ...  44.75
5.0
10209        Decoflex Hanging Personal Folder File, Blue  61.68
5.0

      discount   profit Unnamed: 23 Unnamed: 24  Unnamed: 25
10207      0.0   2.2724         NaN         NaN          NaN
10208      0.0  20.5850         NaN         NaN          NaN
10209      0.2   5.3970         NaN         NaN          NaN

[3 rows x 26 columns]
```

```
df.shape
```

```
(10210, 26)
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10210 entries, 0 to 10209
Data columns (total 26 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   row           10210 non-null  int64
 1   orderid       10210 non-null  object
 2   orderdate     10210 non-null  object
 3   ordermonth    10210 non-null  object
 4   ship_date     10210 non-null  object
 5   delay         10210 non-null  int64
 6   ship_mode     10210 non-null  object
 7   cust_id       10210 non-null  object
 8   cust_name     10210 non-null  object
 9   segment       10210 non-null  object
 10  country       10210 non-null  object
 11  city          10210 non-null  object
 12  state         10210 non-null  object
 13  postal_code   10210 non-null  int64
 14  region        10210 non-null  object
 15  product_id    10210 non-null  object
 16  category      10210 non-null  object
 17  sub_category  10210 non-null  object
 18  product_name  10210 non-null  object
 19  sales         10200 non-null  float64
 20  quantity      10200 non-null  float64
 21  discount      10199 non-null  float64
 22  profit        10194 non-null  float64
 23  Unnamed: 23   0 non-null      float64
 24  Unnamed: 24   0 non-null      float64
 25  Unnamed: 25   1 non-null      float64
dtypes: float64(7), int64(3), object(16)
memory usage: 2.0+ MB
```

```
df.columns
```

```
Index(['row', 'orderid', 'orderdate', 'ordermonth', 'ship_date',
'delay',
       'ship_mode', 'cust_id', 'cust_name', 'segment', 'country',
'city',
       'state', 'postal_code', 'region', 'product_id', 'category',
       'sub_category', 'product_name', 'sales', 'quantity',
'discount',
       'profit', 'Unnamed: 23', 'Unnamed: 24', 'Unnamed: 25'],
      dtype='object')
```

#Transform the Dataset || Data Preprocessing

```
df.duplicated().sum()
```

```
216
```

```
df.drop_duplicates(inplace=True)
```

```
df.shape
```

```
(9994, 26)
```

```
df.isnull().sum()
```

```
row                   0
orderid               0
```

```
orderdate          0
ordermonth         0
ship_date          0
delay              0
ship_mode          0
cust_id            0
cust_name          0
segment            0
country            0
city               0
state              0
postal_code        0
region             0
product_id         0
category           0
sub_category       0
product_name       0
sales             10
quantity          10
discount          11
profit            16
Unnamed: 23     9994
Unnamed: 24     9994
Unnamed: 25     9993
dtype: int64
```

```
df.drop(['Unnamed: 23', 'Unnamed: 24', 'Unnamed: 25'], axis=1,
inplace=True)

df.columns
```

```
Index(['row', 'orderid', 'orderdate', 'ordermonth', 'ship_date',
'delay',
       'ship_mode', 'cust_id', 'cust_name', 'segment', 'country',
'city',
       'state', 'postal_code', 'region', 'product_id', 'category',
       'sub_category', 'product_name', 'sales', 'quantity',
'discount',
       'profit'],
      dtype='object')
```

```
df.fillna({
    'sales': df['sales'].mean(),
    'quantity': df['quantity'].median(),
    'discount': df['discount'].mean(),
    'profit': df['profit'].median()
}, inplace=True)

df.isnull().sum()
```

```
row             0
orderid         0
orderdate       0
ordermonth      0
ship_date       0
delay           0
ship_mode       0
cust_id         0
cust_name       0
segment         0
country         0
city            0
state           0
postal_code     0
region          0
product_id      0
category        0
sub_category    0
product_name    0
sales           0
quantity        0
discount        0
profit          0
dtype: int64
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 9994 entries, 0 to 9993
Data columns (total 23 columns):
 #   Column        Non-Null Count  Dtype 
---  ------        --------------  ----- 
 0   row           9994 non-null   int64 
 1   orderid       9994 non-null   object
 2   orderdate     9994 non-null   object
 3   ordermonth    9994 non-null   object
 4   ship_date     9994 non-null   object
 5   delay         9994 non-null   int64 
 6   ship_mode     9994 non-null   object
 7   cust_id       9994 non-null   object
 8   cust_name     9994 non-null   object
 9   segment       9994 non-null   object
 10  country       9994 non-null   object
 11  city          9994 non-null   object
 12  state         9994 non-null   object
 13  postal_code   9994 non-null   int64 
 14  region        9994 non-null   object
 15  product_id    9994 non-null   object
 16  category      9994 non-null   object
 17  sub_category  9994 non-null   object
 18  product_name  9994 non-null   object
 19  sales         9994 non-null   float64
 20  quantity      9994 non-null   float64
 21  discount      9994 non-null   float64
 22  profit        9994 non-null   float64
dtypes: float64(4), int64(3), object(16)
memory usage: 1.8+ MB
```

```
df.rename(columns={'ship_date':'shipdate',
'ship_mode':'shipmode','cust_id':'customerid','cust_name':'customernam
e','postal_code':'postalcode', 'product_id':'productid',
'sub_category': 'subcategory', 'product_name':'productname'},inplace=
True)
```

```
df.columns
```

```
Index(['row', 'orderid', 'orderdate', 'ordermonth', 'shipdate',
'delay',
       'shipmode', 'customerid', 'customername', 'segment', 'country',
'city',
       'state', 'postalcode', 'region', 'productid', 'category',
'subcategory',
       'productname', 'sales', 'quantity', 'discount', 'profit'],
      dtype='object')
```

```
data=(df[['profit','sales','discount']]).round(1)
```

```
print(data)
```

```
      profit  sales  discount
0       41.9  262.0       0.0
1      219.6  731.9       0.0
2        6.9   14.6       0.0
3     -383.0  957.6       0.4
4        2.5   22.4       0.2
...      ...    ...       ...
9989     4.1   25.2       0.2
9990    15.6   92.0       0.0
9991    19.4  258.6       0.2
9992    13.3   29.6       0.0
9993    72.9  243.2       0.0

[9994 rows x 3 columns]
```

```
df.drop(['profit', 'sales', 'discount'], axis=1, inplace=True)
```

```
df.columns
```

```
Index(['row', 'orderid', 'orderdate', 'ordermonth', 'shipdate',
'delay',
       'shipmode', 'customerid', 'customername', 'segment', 'country',
'city',
       'state', 'postalcode', 'region', 'productid', 'category',
'subcategory',
       'productname', 'quantity'],
      dtype='object')
```

```
data_new = pd.concat([df, data], axis=1)
```

```
data_new.columns
```

```
Index(['row', 'orderid', 'orderdate', 'ordermonth', 'shipdate',
'delay',
       'shipmode', 'customerid', 'customername', 'segment', 'country',
'city',
       'state', 'postalcode', 'region', 'productid', 'category',
'subcategory',
       'productname', 'quantity', 'profit', 'sales', 'discount'],
      dtype='object')
```

```
print(data_new[['profit', 'sales', 'discount']])
```

```
      profit  sales  discount
0       41.9  262.0       0.0
1      219.6  731.9       0.0
2        6.9   14.6       0.0
3     -383.0  957.6       0.4
4        2.5   22.4       0.2
...      ...    ...       ...
9989     4.1   25.2       0.2
9990    15.6   92.0       0.0
9991    19.4  258.6       0.2
9992    13.3   29.6       0.0
9993    72.9  243.2       0.0

[9994 rows x 3 columns]
```

```
data_new.shape
```

```
(9994, 23)
```

```
data_new.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 9994 entries, 0 to 9993
Data columns (total 23 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
 0   row            9994 non-null   int64
 1   orderid        9994 non-null   object
 2   orderdate      9994 non-null   object
 3   ordermonth     9994 non-null   object
 4   shipdate      9994 non-null   object
 5   delay         9994 non-null   int64
 6   shipmode      9994 non-null   object
 7   customerid    9994 non-null   object
 8   customername  9994 non-null   object
 9   segment       9994 non-null   object
 10  country       9994 non-null   object
 11  city          9994 non-null   object
 12  state         9994 non-null   object
 13  postalcode    9994 non-null   int64
 14  region        9994 non-null   object
 15  productid     9994 non-null   object
 16  category      9994 non-null   object
 17  subcategory   9994 non-null   object
 18  productname   9994 non-null   object
 19  quantity      9994 non-null   float64
 20  profit        9994 non-null   float64
 21  sales         9994 non-null   float64
 22  discount      9994 non-null   float64
dtypes: float64(4), int64(3), object(16)
memory usage: 1.8+ MB
```

```
data_new['orderdate'] = pd.to_datetime(data_new['orderdate'],
format='mixed', dayfirst=True)
data_new['shipdate'] = pd.to_datetime(data_new['shipdate'],
format='mixed', dayfirst=True)
```

```
data_new.columns == 'delay'
```

```
array([False, False, False, False, False,  True, False, False, False,
       False, False, False, False, False, False, False, False, False,
       False, False, False, False, False])
```

```
data_new.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 9994 entries, 0 to 9993
Data columns (total 23 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   row           9994 non-null   int64
 1   orderid       9994 non-null   object
 2   orderdate     9994 non-null   datetime64[ns]
 3   ordermonth    9994 non-null   object
 4   shipdate      9994 non-null   datetime64[ns]
 5   delay         9994 non-null   int64
 6   shipmode      9994 non-null   object
 7   customerid    9994 non-null   object
 8   customername  9994 non-null   object
 9   segment       9994 non-null   object
 10  country        9994 non-null   object
 11  city           9994 non-null   object
 12  state          9994 non-null   object
 13  postalcode     9994 non-null   int64
 14  region         9994 non-null   object
 15  productid      9994 non-null   object
 16  category       9994 non-null   object
 17  subcategory    9994 non-null   object
 18  productname    9994 non-null   object
 19  quantity       9994 non-null   float64
 20  profit         9994 non-null   float64
 21  sales          9994 non-null   float64
 22  discount       9994 non-null   float64
dtypes: datetime64[ns](2), float64(4), int64(3), object(14)
memory usage: 1.8+ MB
```

```
data_new['delay']=data_new['orderdate']- data_new['shipdate']
```

```
data_new.columns
```

```
Index(['row', 'orderid', 'orderdate', 'ordermonth', 'shipdate',
'delay',
       'shipmode', 'customerid', 'customername', 'segment', 'country',
'city',
       'state', 'postalcode', 'region', 'productid', 'category',
'subcategory',
       'productname', 'quantity', 'profit', 'sales', 'discount'],
      dtype='object')
```

```
filtered = data_new[data_new['profit'] < 0]
print(filtered['profit'].value_counts())
```

```
profit
-4.8       15
-1.4       15
-2.7       15
-3.0       13
-2.0       13
           ..
-1480.0     1
-427.4      1
-40.8       1
-46.9       1
-54.3       1
Name: count, Length: 829, dtype: int64
```

```
print(len(filtered))
```

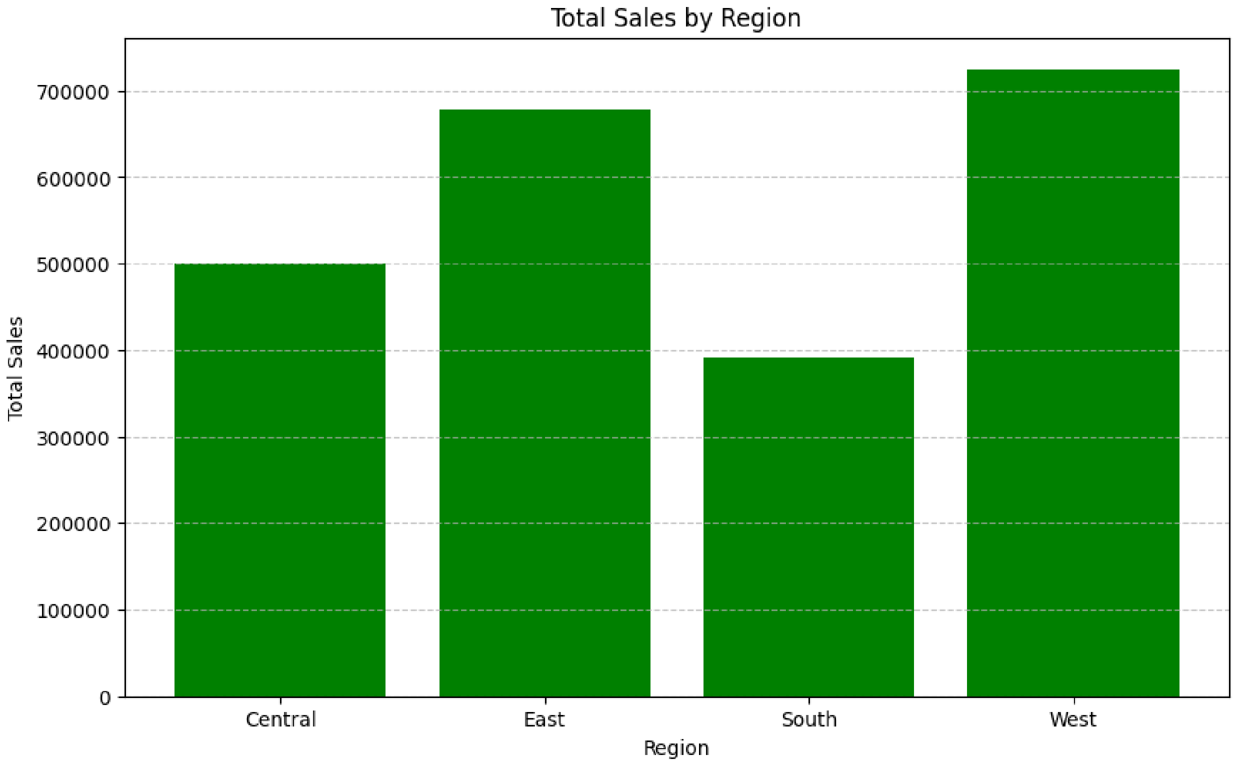
```
1855
```

```
sales_summary= data_new.groupby("region")["sales"].sum().reset_index()
print(sales_summary)
```

```
    region     sales
0  Central  501006.8
1     East  678607.3
2    South  391728.8
3     West  724755.3
```

```
import matplotlib.pyplot as plt

plt.figure(figsize=(10, 6))
plt.bar(sales_summary['region'], sales_summary['sales'], color=
'green')
plt.title("Total Sales by Region")
plt.xlabel("Region")
plt.ylabel("Total Sales")
plt.grid(axis="y", linestyle= "--", alpha=0.7)
plt.show()
```

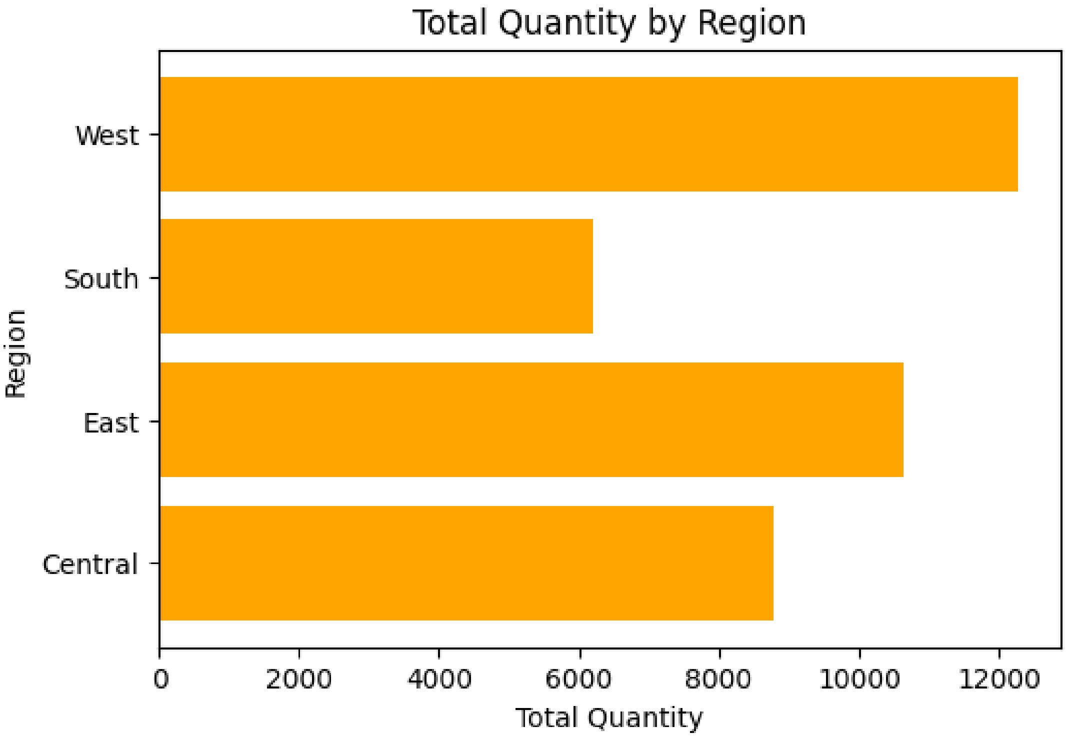


```
quantity_summary= data_new.groupby("region")
["quantity"].sum().reset_index()
print(quantity_summary)
```

```
    region  quantity
0  Central    8766.0
```

```
1     East   10622.0
2    South    6209.0
3     West   12263.0
```

```
plt.figure(figsize=(6, 4))
plt.barh(quantity_summary['region'], quantity_summary['quantity'],
color='orange')
plt.title("Total Quantity by Region")
plt.xlabel("Total Quantity")
plt.ylabel("Region")
plt.show()
```



Load the dataset for further analysis

```
data_new.to_csv('detail.csv',index=False)
```