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

df=pd.read_csv('Amazon Sale Report.csv')
```

```
---------------------------------------------------------------------------
FileNotFoundError                         Traceback (most recent call
last)
<ipython-input-2-cf4f38deaa41> in <cell line: 0>()
----> 1 df=pd.read_csv('Amazon Sale Report.csv',encoding=
'unicode_escape')

/usr/local/lib/python3.11/dist-packages/pandas/io/parsers/readers.py
in read_csv(filepath_or_buffer, sep, delimiter, header, names,
index_col, usecols, dtype, engine, converters, true_values,
false_values, skipinitialspace, skiprows, skipfooter, nrows,
na_values, keep_default_na, na_filter, verbose, skip_blank_lines,
parse_dates, infer_datetime_format, keep_date_col, date_parser,
date_format, dayfirst, cache_dates, iterator, chunksize, compression,
thousands, decimal, lineterminator, quotechar, quoting, doublequote,
escapechar, comment, encoding, encoding_errors, dialect, on_bad_lines,
delim_whitespace, low_memory, memory_map, float_precision,
storage_options, dtype_backend)
   1024     kwds.update(kwds_defaults)
   1025
-> 1026     return _read(filepath_or_buffer, kwds)
   1027
   1028

/usr/local/lib/python3.11/dist-packages/pandas/io/parsers/readers.py
in _read(filepath_or_buffer, kwds)
    618
    619     # Create the parser.
--> 620     parser = TextFileReader(filepath_or_buffer, **kwds)
    621
    622     if chunksize or iterator:

/usr/local/lib/python3.11/dist-packages/pandas/io/parsers/readers.py
in __init__(self, f, engine, **kwds)
   1618
   1619         self.handles: IOHandles | None = None
-> 1620         self._engine = self._make_engine(f, self.engine)
   1621
   1622     def close(self) -> None:

/usr/local/lib/python3.11/dist-packages/pandas/io/parsers/readers.py
```

```
in _make_engine(self, f, engine)
   1878                 if "b" not in mode:
   1879                     mode += "b"
-> 1880             self.handles = get_handle(
   1881                 f,
   1882                 mode,

/usr/local/lib/python3.11/dist-packages/pandas/io/common.py in
get_handle(path_or_buf, mode, encoding, compression, memory_map,
is_text, errors, storage_options)
    871         if ioargs.encoding and "b" not in ioargs.mode:
    872             # Encoding
--> 873             handle = open(
    874                 handle,
    875                 ioargs.mode,

FileNotFoundError: [Errno 2] No such file or directory: 'Amazon Sale
Report.csv'
```

```
df.shape
```

```
(128976, 21)
```

```
df.head()
```

```
   index             Order ID      Date                        Status
\
0      0  405-8078784-5731545  04-30-22                     Cancelled

1      1  171-9198151-1101146  04-30-22  Shipped - Delivered to Buyer

2      2  404-0687676-7273146  04-30-22                       Shipped

3      3  403-9615377-8133951  04-30-22                     Cancelled

4      4  407-1069790-7240320  04-30-22                       Shipped


  Fulfilment Sales Channel ship-service-level  Category Size Courier
Status  \
0   Merchant     Amazon.in           Standard   T-shirt    S     On
the Way
1   Merchant     Amazon.in           Standard     Shirt  3XL
Shipped
2     Amazon     Amazon.in          Expedited     Shirt   XL
Shipped
3   Merchant     Amazon.in           Standard   Blazzer    L     On
the Way
4     Amazon     Amazon.in          Expedited  Trousers  3XL
Shipped
```

```
   ...  currency  Amount    ship-city   ship-state ship-postal-code  \
0  ...       INR  647.62       MUMBAI  MAHARASHTRA         400081.0
1  ...       INR  406.00    BENGALURU    KARNATAKA         560085.0
2  ...       INR  329.00  NAVI MUMBAI  MAHARASHTRA         410210.0
3  ...       INR  753.33   PUDUCHERRY   PUDUCHERRY         605008.0
4  ...       INR  574.00      CHENNAI   TAMIL NADU         600073.0

   ship-country    B2B  fulfilled-by New  PendingS
0            IN  False     Easy Ship NaN       NaN
1            IN  False     Easy Ship NaN       NaN
2            IN   True           NaN NaN       NaN
3            IN  False     Easy Ship NaN       NaN
4            IN  False           NaN NaN       NaN

[5 rows x 21 columns]
```

```
df.tail()
```

```
         index             Order ID      Date   Status Fulfilment  \
128971  128970  406-6001380-7673107  05-31-22  Shipped     Amazon
128972  128971  402-9551604-7544318  05-31-22  Shipped     Amazon
128973  128972  407-9547469-3152358  05-31-22  Shipped     Amazon
128974  128973  402-6184140-0545956  05-31-22  Shipped     Amazon
128975  128974  408-7436540-8728312  05-31-22  Shipped     Amazon

       Sales Channel ship-service-level Category Size Courier
Status  ...  \
128971     Amazon.in          Expedited    Shirt   XL
Shipped  ...
128972     Amazon.in          Expedited  T-shirt    M
Shipped  ...
128973     Amazon.in          Expedited  Blazzer  XXL
Shipped  ...
128974     Amazon.in          Expedited  T-shirt   XS
Shipped  ...
128975     Amazon.in          Expedited  T-shirt    S
Shipped  ...

        currency  Amount  ship-city    ship-state ship-postal-code  \
128971       INR   517.0  HYDERABAD     TELANGANA         500013.0
128972       INR   999.0   GURUGRAM       HARYANA         122004.0
128973       INR   690.0  HYDERABAD     TELANGANA         500049.0
128974       INR  1199.0      Halol       Gujarat         389350.0
128975       INR   696.0     Raipur  CHHATTISGARH         492014.0

        ship-country    B2B  fulfilled-by New  PendingS
128971            IN  False           NaN NaN       NaN
128972            IN  False           NaN NaN       NaN
128973            IN  False           NaN NaN       NaN
128974            IN  False           NaN NaN       NaN
```

```
128975            IN   False           NaN NaN       NaN

[5 rows x 21 columns]
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 128976 entries, 0 to 128975
Data columns (total 21 columns):
 #   Column              Non-Null Count   Dtype  
---  ------              --------------   -----  
 0   index               128976 non-null  int64  
 1   Order ID            128976 non-null  object 
 2   Date                128976 non-null  object 
 3   Status              128976 non-null  object 
 4   Fulfilment          128976 non-null  object 
 5   Sales Channel       128976 non-null  object 
 6   ship-service-level  128976 non-null  object 
 7   Category            128976 non-null  object 
 8   Size                128976 non-null  object 
 9   Courier Status      128976 non-null  object 
 10  Qty                 128976 non-null  int64  
 11  currency            121176 non-null  object 
 12  Amount              121176 non-null  float64
 13  ship-city           128941 non-null  object 
 14  ship-state          128941 non-null  object 
 15  ship-postal-code    128941 non-null  float64
 16  ship-country        128941 non-null  object 
 17  B2B                 128976 non-null  bool   
 18  fulfilled-by        39263 non-null   object 
 19  New                 0 non-null       float64
 20  PendingS            0 non-null       float64
dtypes: bool(1), float64(4), int64(2), object(14)
memory usage: 19.8+ MB
```

```
#drop unrelated/blank columns
df.drop(['New','PendingS'], axis=1, inplace=True)
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 128976 entries, 0 to 128975
Data columns (total 19 columns):
 #   Column              Non-Null Count   Dtype  
---  ------              --------------   -----  
 0   index               128976 non-null  int64  
 1   Order ID            128976 non-null  object 
 2   Date                128976 non-null  object 
 3   Status              128976 non-null  object 
 4   Fulfilment          128976 non-null  object 
 5   Sales Channel       128976 non-null  object
 6   ship-service-level  128976 non-null  object
 7   Category            128976 non-null  object
 8   Size                128976 non-null  object
 9   Courier Status      128976 non-null  object
 10  Qty                 128976 non-null  int64
 11  currency            121176 non-null  object
 12  Amount              121176 non-null  float64
 13  ship-city           128941 non-null  object
 14  ship-state          128941 non-null  object
 15  ship-postal-code    128941 non-null  float64
 16  ship-country        128941 non-null  object
 17  B2B                 128976 non-null  bool
 18  fulfilled-by        39263 non-null   object
dtypes: bool(1), float64(2), int64(2), object(14)
memory usage: 17.8+ MB
```

```
pd.isnull(df)
# checking null value
```

```
        index  Order ID   Date  Status  Fulfilment  Sales Channel  \
0       False     False  False   False       False          False
1       False     False  False   False       False          False
2       False     False  False   False       False          False
3       False     False  False   False       False          False
4       False     False  False   False       False          False
...       ...       ...    ...     ...         ...            ...
128971  False     False  False   False       False          False
128972  False     False  False   False       False          False
128973  False     False  False   False       False          False
128974  False     False  False   False       False          False
128975  False     False  False   False       False          False

        ship-service-level  Category   Size  Courier Status    Qty
currency  \
0                    False     False  False           False  False
False
1                    False     False  False           False  False
False
2                    False     False  False           False  False
False
3                    False     False  False           False  False
False
4                    False     False  False           False  False
False
...                    ...       ...    ...             ...    ...
...
128971               False     False  False           False  False
False
128972               False     False  False           False  False
```

```
False
128973               False     False  False           False  False
False
128974               False     False  False           False  False
False
128975               False     False  False           False  False
False

        Amount  ship-city  ship-state  ship-postal-code  ship-country
B2B  \
0        False      False       False             False         False
False
1        False      False       False             False         False
False
2        False      False       False             False         False
False
3        False      False       False             False         False
False
4        False      False       False             False         False
False
...        ...        ...         ...               ...           ...
...
128971   False      False       False             False         False
False
128972   False      False       False             False         False
False
128973   False      False       False             False         False
False
128974   False      False       False             False         False
False
128975   False      False       False             False         False
False

        fulfilled-by
0              False
1              False
2               True
3              False
4               True
...              ...
128971          True
128972          True
128973          True
128974          True
128975          True

[128976 rows x 19 columns]
```

```
pd.isnull(df).sum()
# sum will give total values of null values
```

```
index                     0
Order ID                  0
Date                      0
Status                    0
Fulfilment                0
Sales Channel             0
ship-service-level        0
Category                  0
Size                      0
Courier Status            0
Qty                       0
currency               7800
Amount                 7800
ship-city                35
ship-state               35
ship-postal-code         35
ship-country             35
B2B                       0
fulfilled-by          89713
dtype: int64
```

```
df.shape
```

```
(128976, 19)
```

```
#drop null values
df.dropna(inplace=True)
```

```
df.shape
```

```
(37514, 19)
```

```
df.columns
```

```
Index(['index', 'Order ID', 'Date', 'Status', 'Fulfilment', 'Sales
Channel',
       'ship-service-level', 'Category', 'Size', 'Courier Status',
'Qty',
       'currency', 'Amount', 'ship-city', 'ship-state', 'ship-postal-
code',
       'ship-country', 'B2B', 'fulfilled-by'],
      dtype='object')
```

```
# change data type
df['ship-postal-code']=df['ship-postal-code'].astype('int')
```

```
#checking whether the  data type change or not
df['ship-postal-code'].dtype
```

```
dtype('int32')
```

```
df['Date']=pd.to_datetime (df['Date'])
```

```
df.columns
```

```
Index(['index', 'Order ID', 'Date', 'Status', 'Fulfilment', 'Sales
Channel',
       'ship-service-level', 'Category', 'Size', 'Courier Status',
'Qty',
       'currency', 'Amount', 'ship-city', 'ship-state', 'ship-postal-
code',
       'ship-country', 'B2B', 'fulfilled-by'],
      dtype='object')
```

```
#rename Columns
df.rename(columns={'Qty':'Quantity'})
```

```
         index             Order ID       Date
Status  \
0            0  405-8078784-5731545 2022-04-30
Cancelled
1            1  171-9198151-1101146 2022-04-30  Shipped - Delivered to
Buyer
3            3  403-9615377-8133951 2022-04-30
Cancelled
7            7  406-7807733-3785945 2022-04-30  Shipped - Delivered to
Buyer
12          12  405-5513694-8146768 2022-04-30  Shipped - Delivered to
Buyer
...        ...                  ...        ...
...
128875  128874  405-4724097-1016369 2022-06-01  Shipped - Delivered to
Buyer
128876  128875  403-9524128-9243508 2022-06-01
Cancelled
128888  128887  405-6493630-8542756 2022-05-31  Shipped - Delivered to
Buyer
128891  128890  407-0116398-1810752 2022-05-31
Cancelled
128892  128891  403-0317423-9322704 2022-05-31  Shipped - Delivered to
Buyer

       Fulfilment Sales Channel ship-service-level  Category  Size  \
0        Merchant     Amazon.in           Standard   T-shirt     S
1        Merchant     Amazon.in           Standard     Shirt   3XL
3        Merchant     Amazon.in           Standard   Blazzer     L
7        Merchant     Amazon.in           Standard     Shirt     S
12       Merchant     Amazon.in           Standard     Shirt    XS
...           ...           ...                ...       ...   ...
128875   Merchant     Amazon.in           Standard   T-shirt     S
128876   Merchant     Amazon.in           Standard   Blazzer    XL
128888   Merchant     Amazon.in           Standard  Trousers     M
128891   Merchant     Amazon.in           Standard    Wallet  Free
```

```
128892   Merchant     Amazon.in           Standard   Blazzer     M

       Courier Status  Quantity currency  Amount       ship-city  \
0          On the Way         0      INR  647.62          MUMBAI
1             Shipped         1      INR  406.00       BENGALURU
3          On the Way         0      INR  753.33      PUDUCHERRY
7             Shipped         1      INR  399.00       HYDERABAD
12            Shipped         1      INR  399.00       Amravati.
...               ...       ...      ...     ...             ...
128875        Shipped         1      INR  854.00           ALLUR
128876     On the Way         0      INR  734.29       Barabanki
128888        Shipped         1      INR  518.00           NOIDA
128891     On the Way         0      INR  398.10         MADURAI
128892        Shipped         1      INR  721.00  UTTAR BAGDOGRA

            ship-state  ship-postal-code ship-country    B2B
fulfilled-by
0          MAHARASHTRA            400081           IN  False    Easy
Ship
1            KARNATAKA            560085           IN  False    Easy
Ship
3           PUDUCHERRY            605008           IN  False    Easy
Ship
7            TELANGANA            500032           IN  False    Easy
Ship
12         MAHARASHTRA            444606           IN  False    Easy
Ship
...                ...               ...          ...    ...
...
128875  ANDHRA PRADESH            524315           IN  False    Easy
Ship
128876   UTTAR PRADESH            225001           IN  False    Easy
Ship
128888   UTTAR PRADESH            201301           IN  False    Easy
Ship
128891      TAMIL NADU            625007           IN  False    Easy
Ship
128892     WEST BENGAL            734014           IN  False    Easy
Ship

[37514 rows x 19 columns]
```

```
#describe() method return description of the data in the DataFrame(i.e
count,mean,std,min..etc)
df.describe()
```

```
               index                           Date           Qty  \
count   37514.000000                          37514  37514.000000
mean    60953.809858  2022-05-11 07:56:47.303939840      0.867383
min         0.000000            2022-03-31 00:00:00      0.000000
```

```
25%     27235.250000            2022-04-20 00:00:00      1.000000
50%     63470.500000            2022-05-09 00:00:00      1.000000
75%     91790.750000            2022-06-01 00:00:00      1.000000
max    128891.000000            2022-06-29 00:00:00      5.000000
std     36844.853039                            NaN      0.354160

             Amount  ship-postal-code
count  37514.000000      37514.000000
mean     646.553960     463291.552754
min        0.000000     110001.000000
25%      458.000000     370465.000000
50%      629.000000     500019.000000
75%      771.000000     600042.000000
max     5495.000000     989898.000000
std      279.952414     194550.425637
```

```
df.describe(include='object')
```

```
                   Order ID                        Status
Fulfilment  \
count                 37514                         37514      37514

unique                34664                            11          1

top     171-5057375-2831560  Shipped - Delivered to Buyer   Merchant

freq                     12                         28741      37514


       Sales Channel ship-service-level Category   Size Courier Status
\
count          37514              37514    37514  37514          37514

unique             1                  1        8     11              3

top        Amazon.in           Standard  T-shirt      M        Shipped

freq           37514              37514    14062   6892          31859


       currency  ship-city   ship-state ship-country fulfilled-by
count     37514      37514        37514        37514        37514
unique        1       4698           58            1            1
top         INR  BENGALURU  MAHARASHTRA           IN    Easy Ship
freq      37514       2839         6236        37514        37514
```

```
#use describe() for specific columns
df[['Qty','Amount']].describe()
```

```
                Qty        Amount
count  37514.000000  37514.000000
```

```
mean       0.867383    646.553960
std        0.354160    279.952414
min        0.000000      0.000000
25%        1.000000    458.000000
50%        1.000000    629.000000
75%        1.000000    771.000000
max        5.000000   5495.000000
```

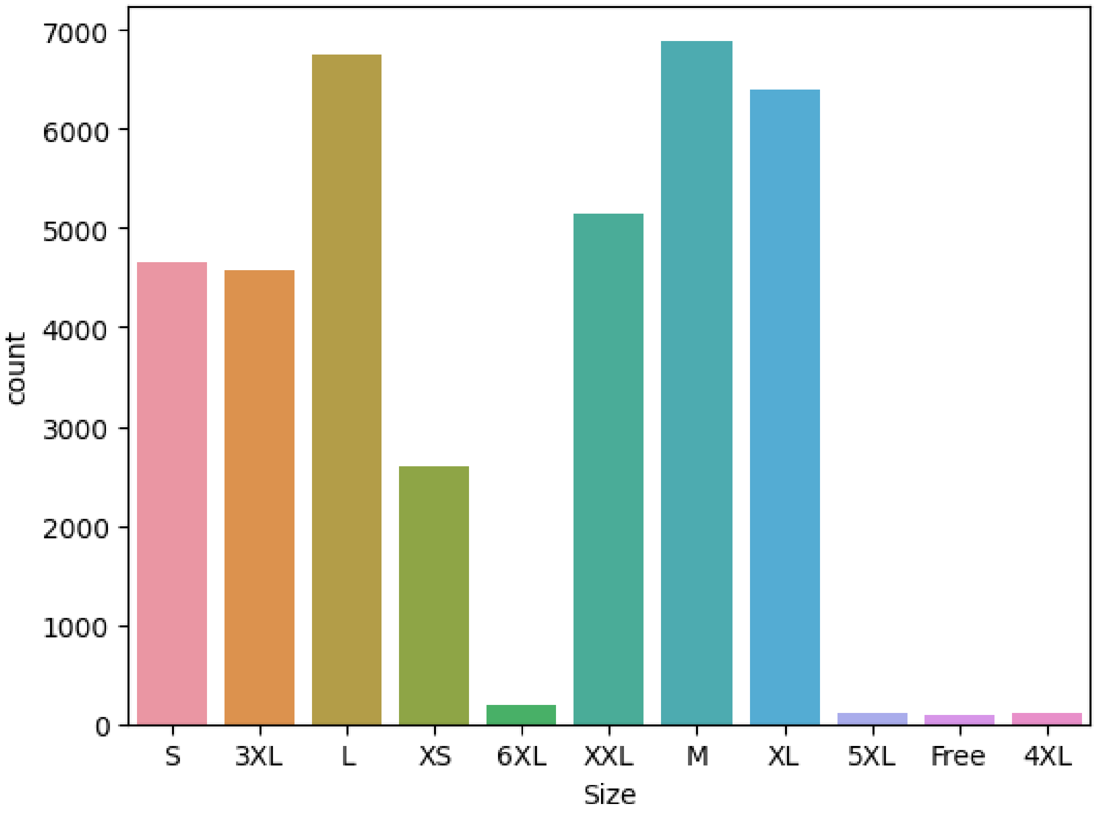
Exploratory Data Analysis

```
df.columns
```

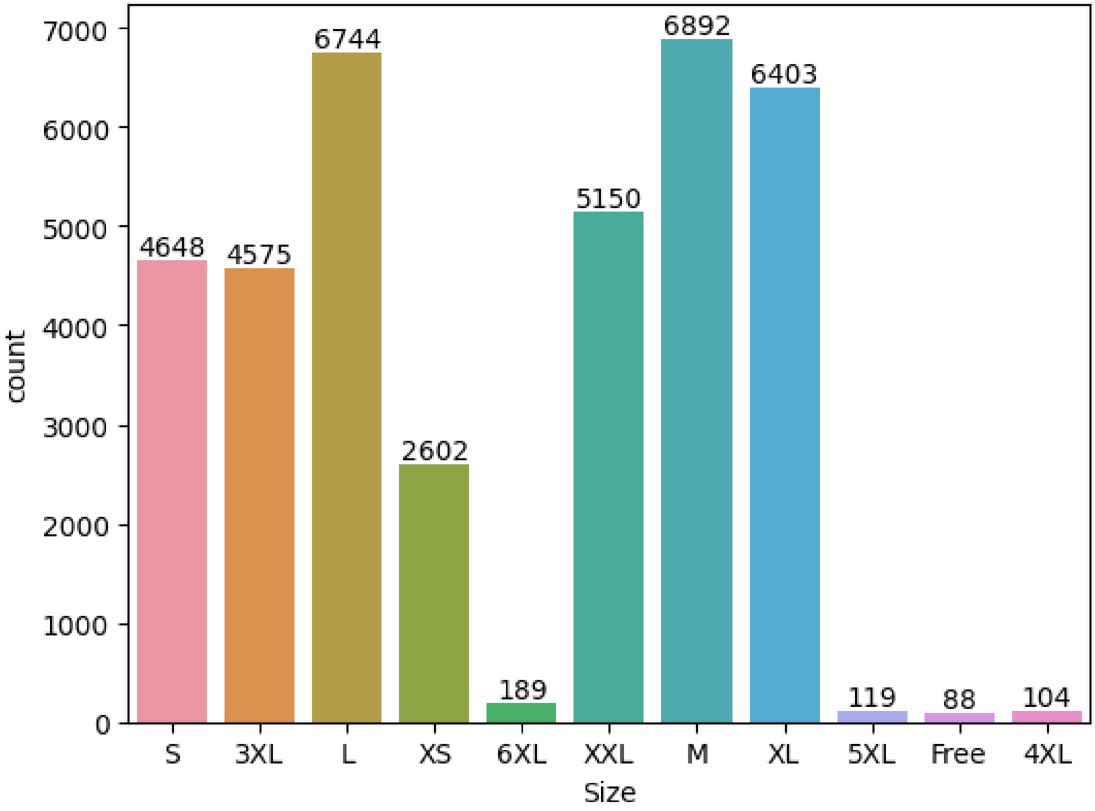
```
Index(['index', 'Order ID', 'Date', 'Status', 'Fulfilment', 'Sales
Channel',
       'ship-service-level', 'Category', 'Size', 'Courier Status',
'Qty',
       'currency', 'Amount', 'ship-city', 'ship-state', 'ship-postal-
code',
       'ship-country', 'B2B', 'fulfilled-by'],
      dtype='object')
```

size

```
ax=sns.countplot(x='Size' ,data=df)
```



```
ax=sns.countplot(x='Size' ,data=df)

for bars in ax.containers:
    ax.bar_label(bars)
```



Note: From above Graph you can see that most of the people buys M-Size

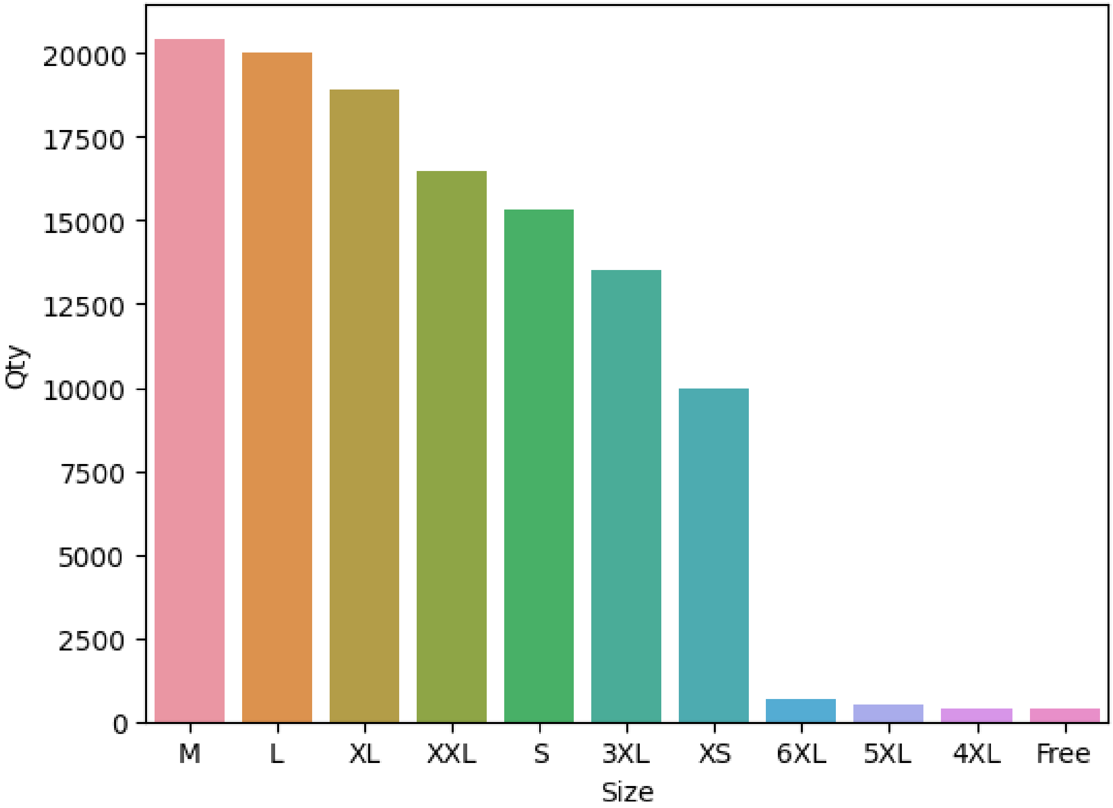
Group By

The groupby() function in pandas is used to group data based on one or more columns in a DataFrame

```
df.groupby(['Size'], as_index=False)
['Qty'].sum().sort_values(by='Qty',ascending=False)

    Size   Qty
6      M  5978
5      L  5875
8     XL  5543
10   XXL  4518
0    3XL  4008
7      S  3973
9     XS  2204
3    6XL   170
2    5XL   104
1    4XL    93
4   Free    73
```

```
S_Qty=df.groupby(['Size'], as_index=False)
['Qty'].sum().sort_values(by='Qty',ascending=False)

sns.barplot(x='Size',y='Qty', data=S_Qty)
```

```
<Axes: xlabel='Size', ylabel='Qty'>
```

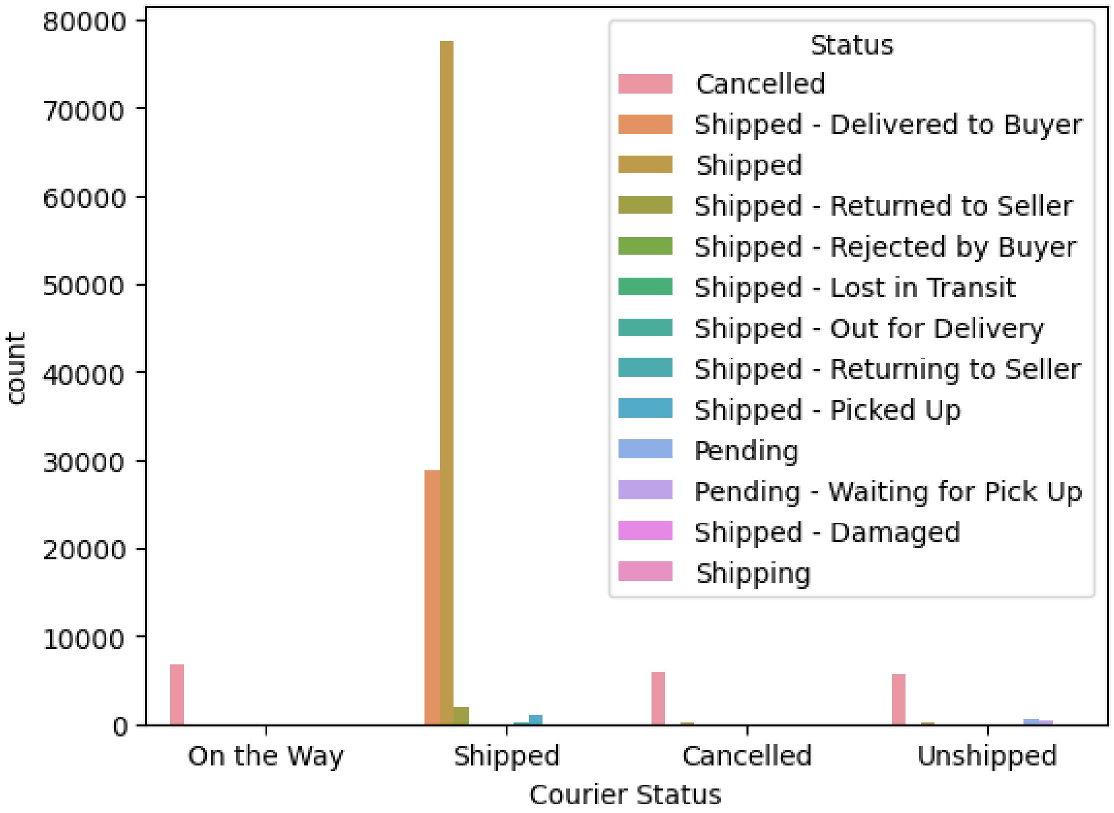


Note: From above Graph you can see that most of the Qty buys M-Size in the sales

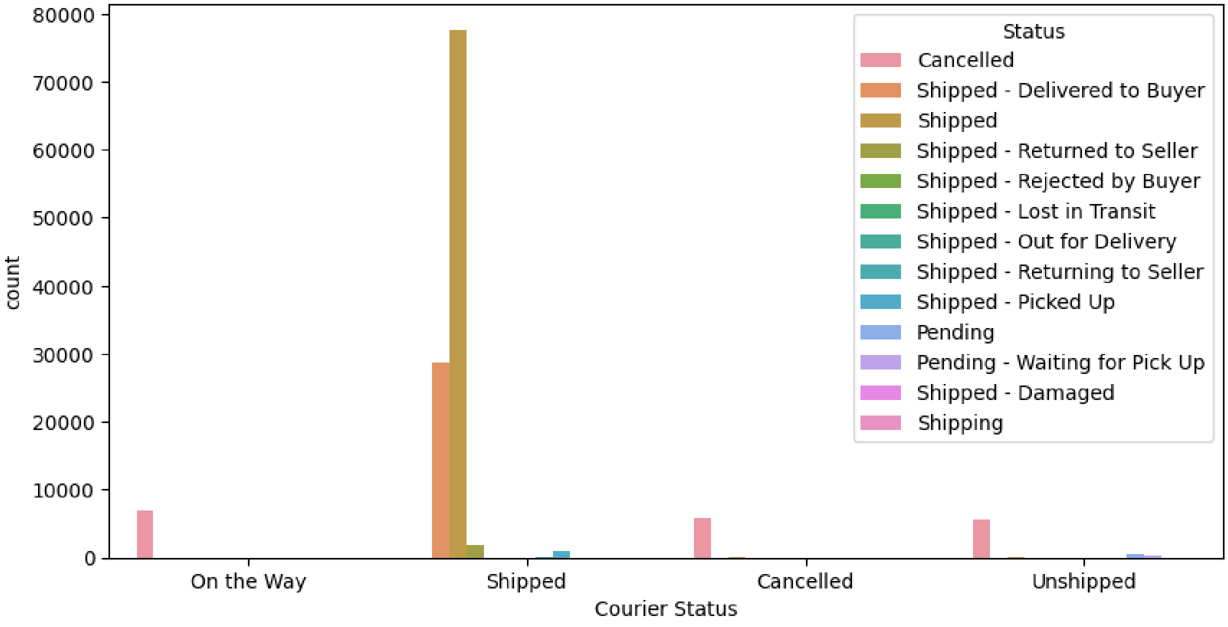
Courier Status

```
sns.countplot(data=df, x='Courier Status',hue= 'Status')
```

```
<Axes: xlabel='Courier Status', ylabel='count'>
```



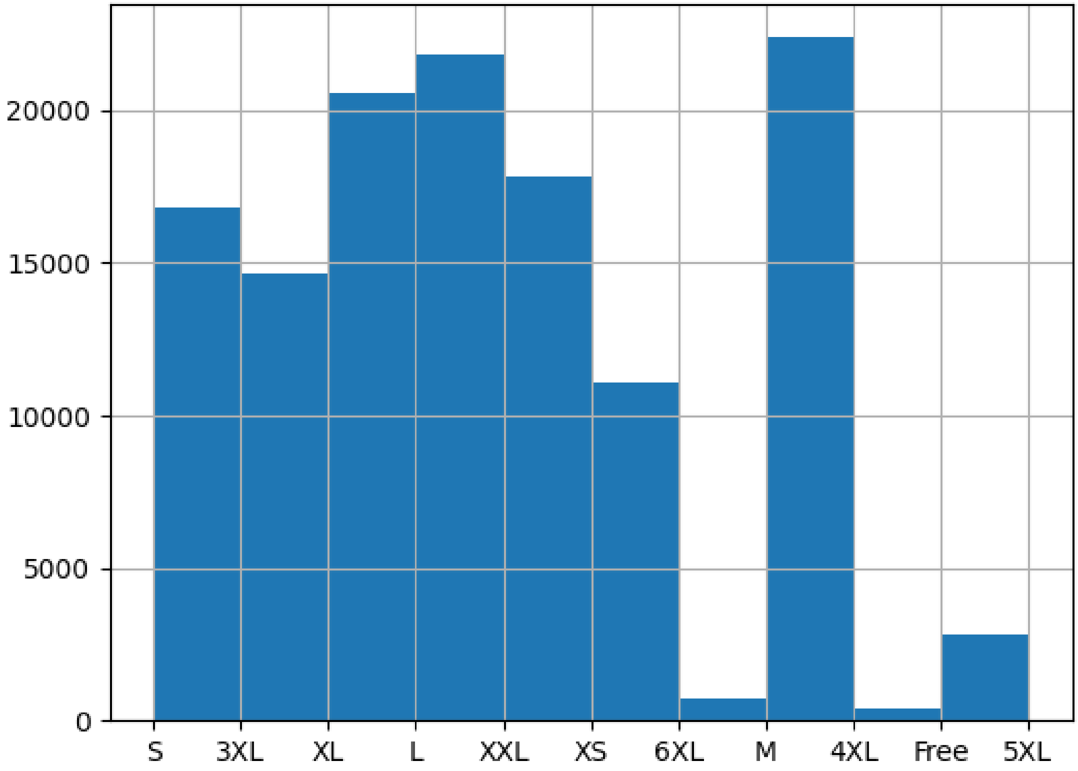
```
plt.figure(figsize=(10,5))

ax=sns.countplot(data=df, x='Courier Status',hue= 'Status')

plt.show()
```



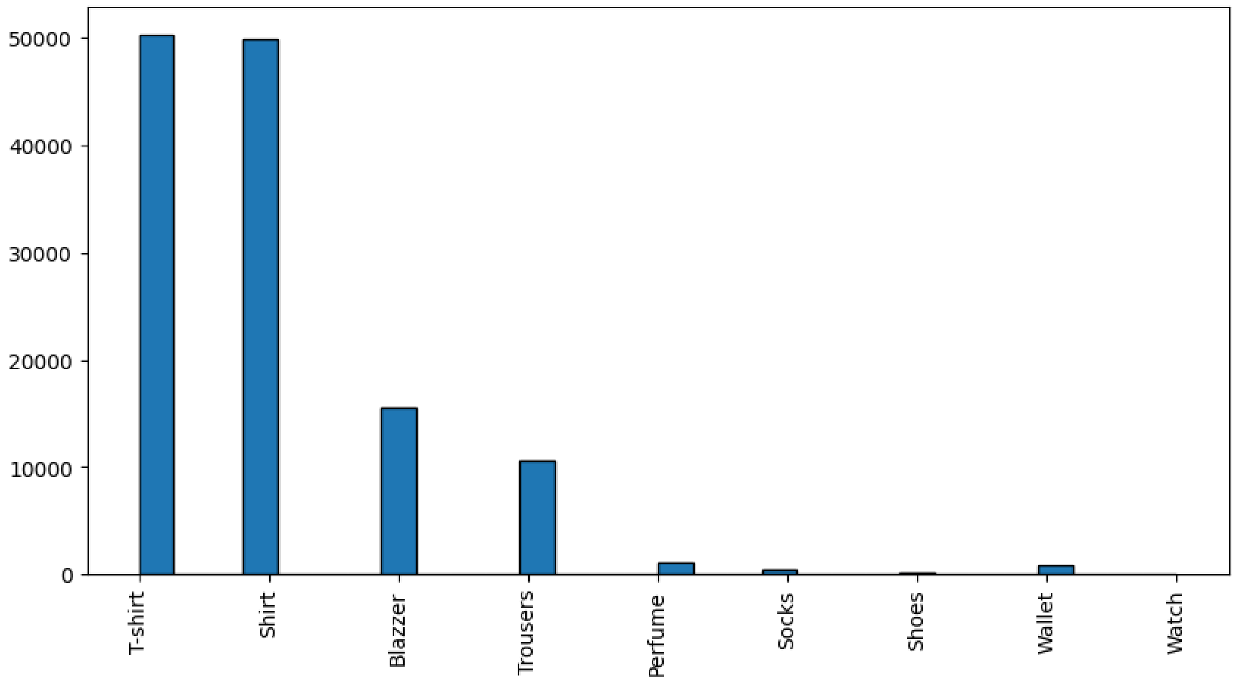
Note: From above Graph the majority of the orders are shipped through the courier.

```
#histogram
df['Size'].hist()
```

```
<Axes: >
```

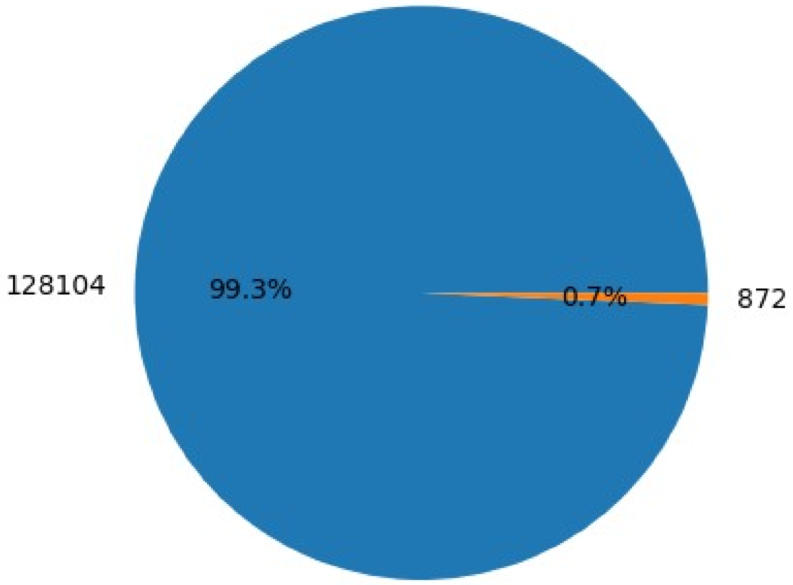


```
df['Category'] = df['Category'].astype(str)
column_data = df['Category']
plt.figure(figsize=(10, 5))
plt.hist(column_data, bins=30, edgecolor='Black')
plt.xticks(rotation=90)
plt.show()
```

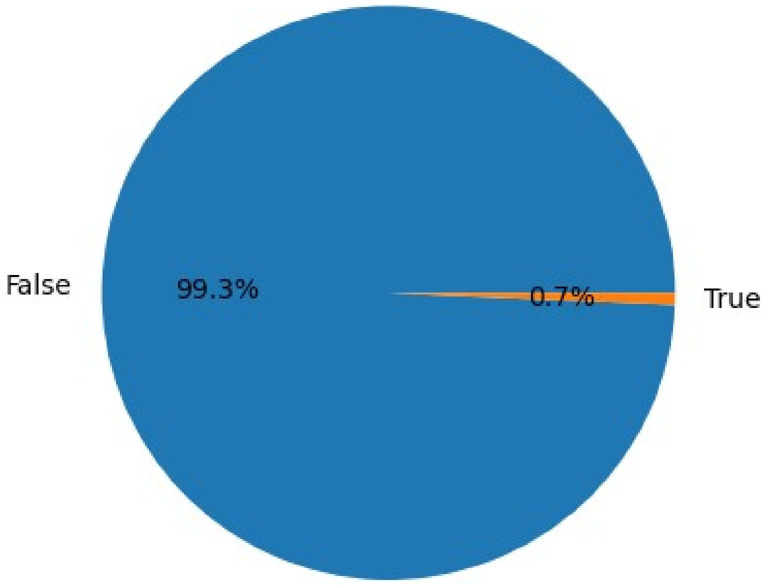


Note: From above Graph you can see that most of the buyers are T-shirt

```
# Checking B2B Data  by using pie chart
B2B_Check = df['B2B'].value_counts()

#  Plot the pie chart
plt.pie(B2B_Check, labels=B2B_Check, autopct='%1.1f%%')
#plt.axis('equal')
plt.show()
```

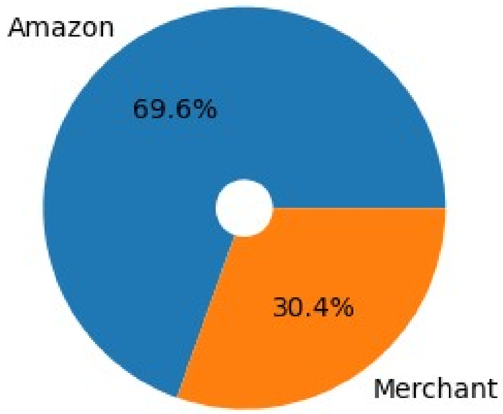


```
# Checking B2B Data  by using pie chart
B2B_Check = df['B2B'].value_counts()

#  Plot the pie chart
plt.pie(B2B_Check, labels=B2B_Check.index, autopct='%1.1f%%')
#plt.axis('equal')
plt.show()
```



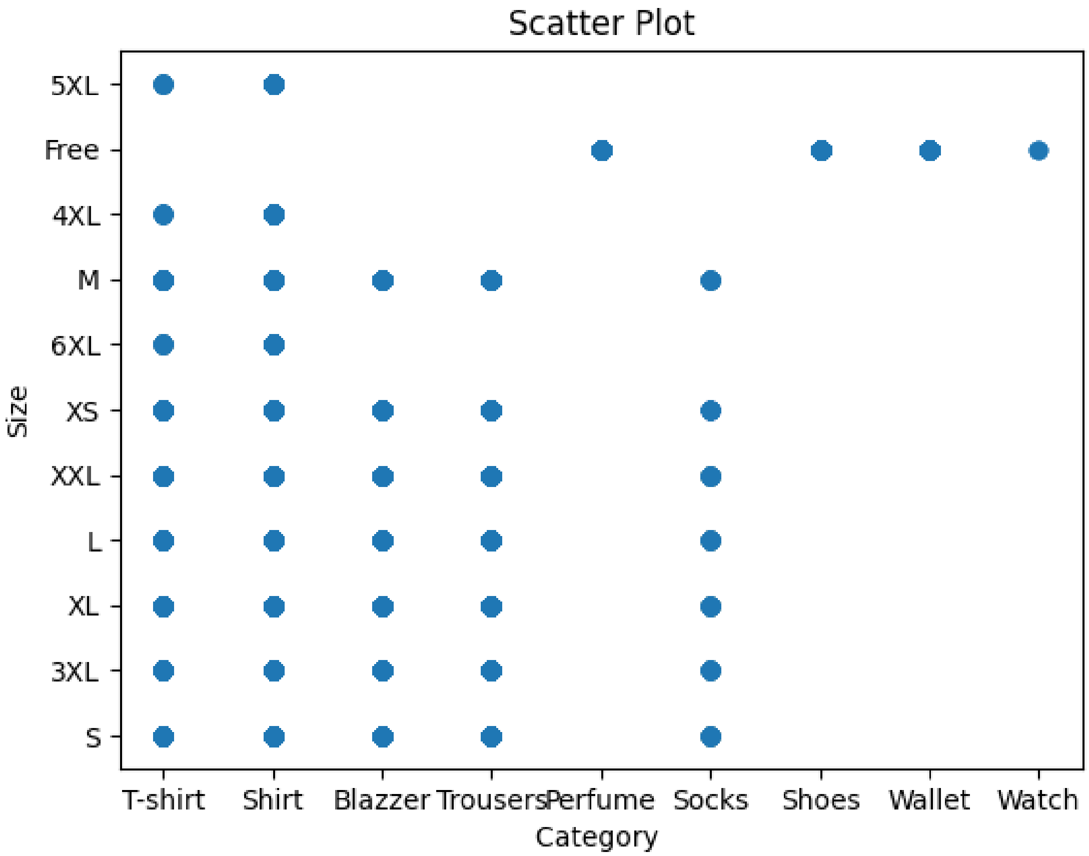
Note : From above chart we can see that maximum i.e. 99.3% of buyers are retailers and 0.7% are B2B buyers

```
#  Prepare data for pie chart
a1 = df['Fulfilment'].value_counts()

# Step 4: Plot the pie chart
fig, ax = plt.subplots()

ax.pie(a1, labels=a1.index, autopct='%1.1f%%', radius=0.7, 
wedgeprops=dict(width=0.6))
ax.set(aspect="equal")

plt.show()
```

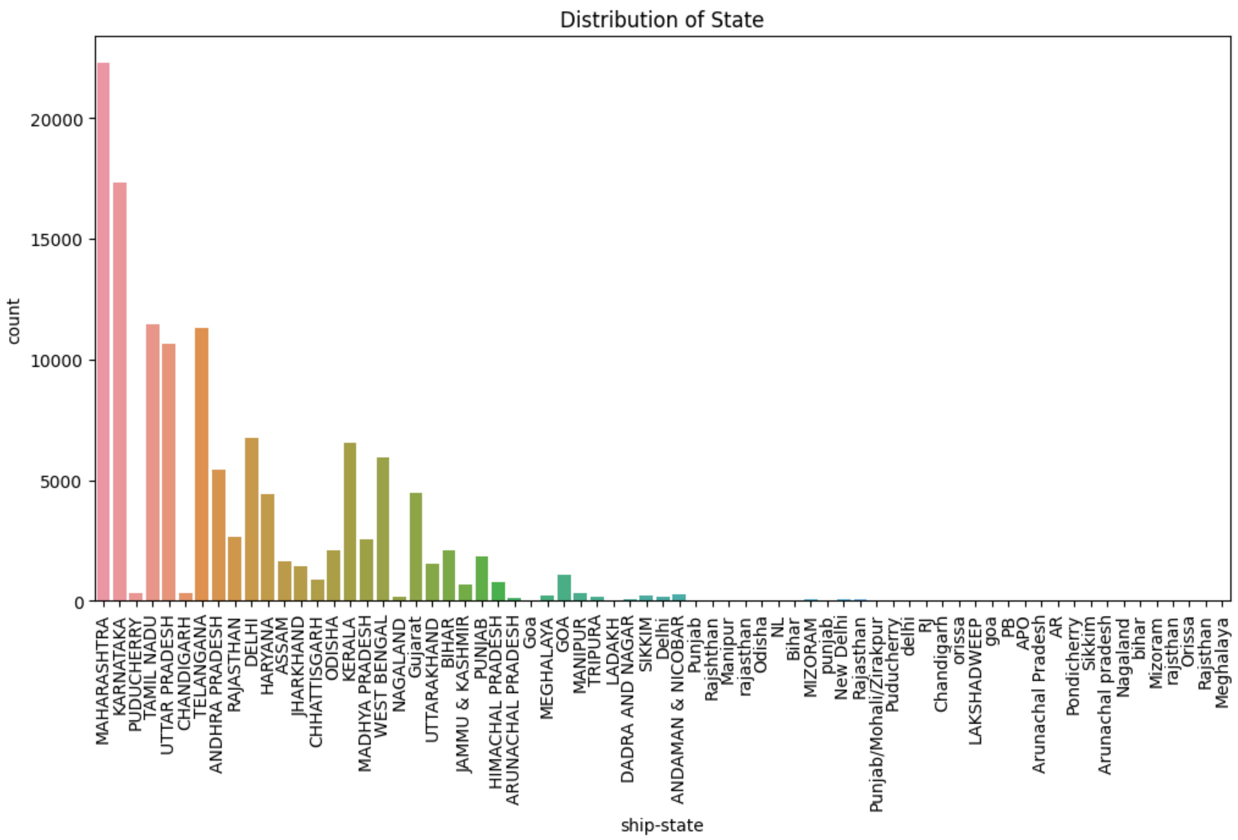


Note: From above chart you can see that most of the Fulfilment are amazon

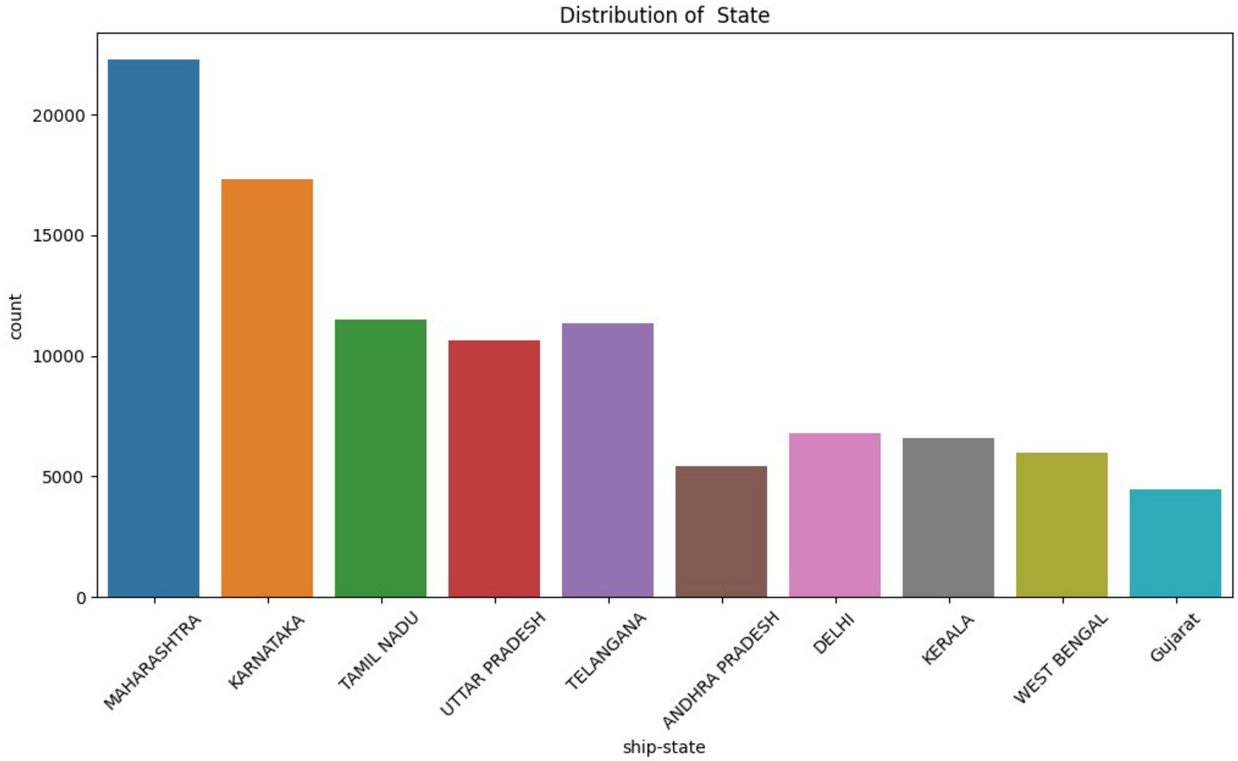
```
# Prepare data for scatter plot
x_data = df['Category']
y_data = df['Size']

# Plot the scatter plot
plt.scatter(x_data, y_data)
plt.xlabel('Category ')
plt.ylabel('Size')
plt.title('Scatter Plot')
plt.show()
```



```
# Plot count of cities by state
plt.figure(figsize=(12, 6))
sns.countplot(data=df, x='ship-state')
plt.xlabel('ship-state')
plt.ylabel('count')
plt.title('Distribution of State')
plt.xticks(rotation=90)
plt.show()
```



```
# top_10_States
top_10_state = df['ship-state'].value_counts().head(10)
# Plot count of cities by state
plt.figure(figsize=(12, 6))
sns.countplot(data=df[df['ship-state'].isin(top_10_state.index)],
x='ship-state')
plt.xlabel('ship-state')
plt.ylabel('count')
plt.title('Distribution of  State')
plt.xticks(rotation=45)
plt.show()
```



Note: From above Graph you can see that most of the buyers are Maharashtra state

Conclusion

The data analysis reveals that the business has a significant customer base in Maharashtra state, mainly serves retailers, fulfills orders through Amazon, experiences high demand for T-shirts, and sees M-Size as the preferred choice among buyers.