Adidas Sales EDA and Forecast

Dataset :

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9648 entries, 0 to 9647
Data columns (total 13 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   Retailer          9648 non-null   object
 1   Retailer ID       9648 non-null   object
 2   Invoice Date      9648 non-null   datetime64[ns]
 3   Region            9648 non-null   object
 4   State             9648 non-null   object
 5   City              9648 non-null   object
 6   Product           9648 non-null   object
 7   Price per Unit    9648 non-null   float64
 8   Units Sold        9648 non-null   int64
 9   Total Sales       9648 non-null   float64
 10  Operating Profit  9648 non-null   float64
 11  Operating Margin  9648 non-null   float64
 12  Sales Method      9648 non-null   object
dtypes: datetime64[ns](1), float64(4), int64(1), object(7)
memory usage: 980.0+ KB
```

## EDA-Exploratory Data Analysis

1) Total revenue = $ 899.9 million

2) Product-- Range, Units Sold, Total Sales

	Product	Total Sales	Units Sold
1	Men's Street Footwear	208826244.0	593320
2	Women's Apparel	179038860.0	433827
3	Men's Athletic Footwear	153673680.0	435526
4	Women's Street Footwear	128002813.0	392269
5	Men's Apparel	123728632.0	306683
6	Women's Athletic Footwear	106631896.0	317236

Total Sales by Product

Product
Men's Street Footwear
Women's Apparel
Men's Athletic Footwear
Women's Street Footwear
Men's Apparel
Women's Athletic Footwear

Units Sold by Product

Product
Men's Street Footwear
Women's Apparel
Men's Athletic Footwear
Women's Street Footwear
Men's Apparel
Women's Athletic Footwear
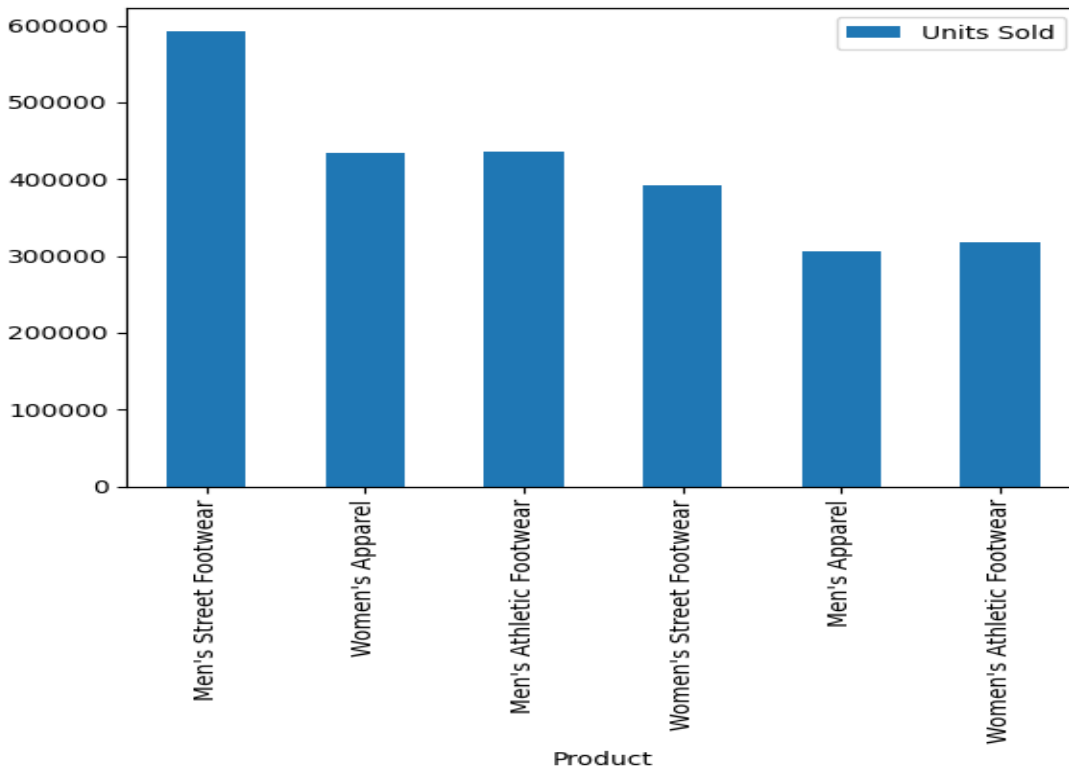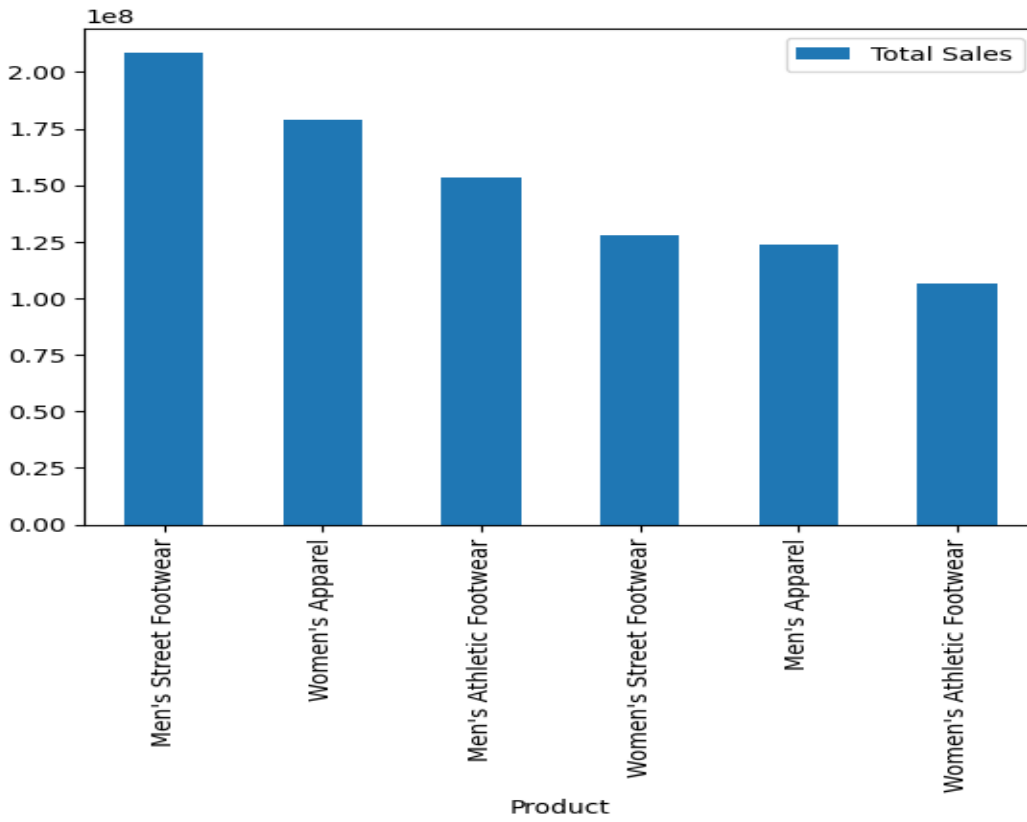
3) Sales Method Vs Total Sales, Operating Margin, Operating Profit

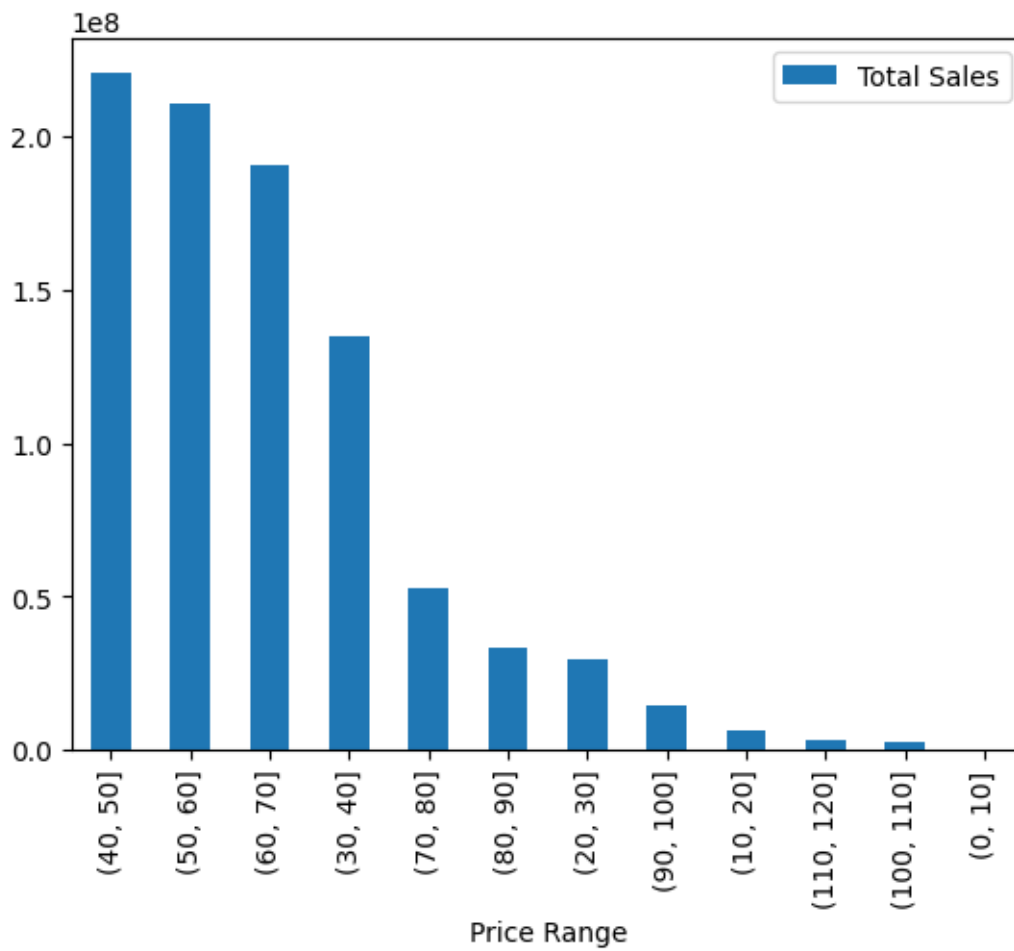|	Sales Method	Total Sales	Operating Margin	Operating Profit
0	In-store	356643750.0	619.65	1.275913e+08
1	Online	247672882.0	2269.24	9.655518e+07
2	Outlet	295585493.0	1192.13	1.079883e+08
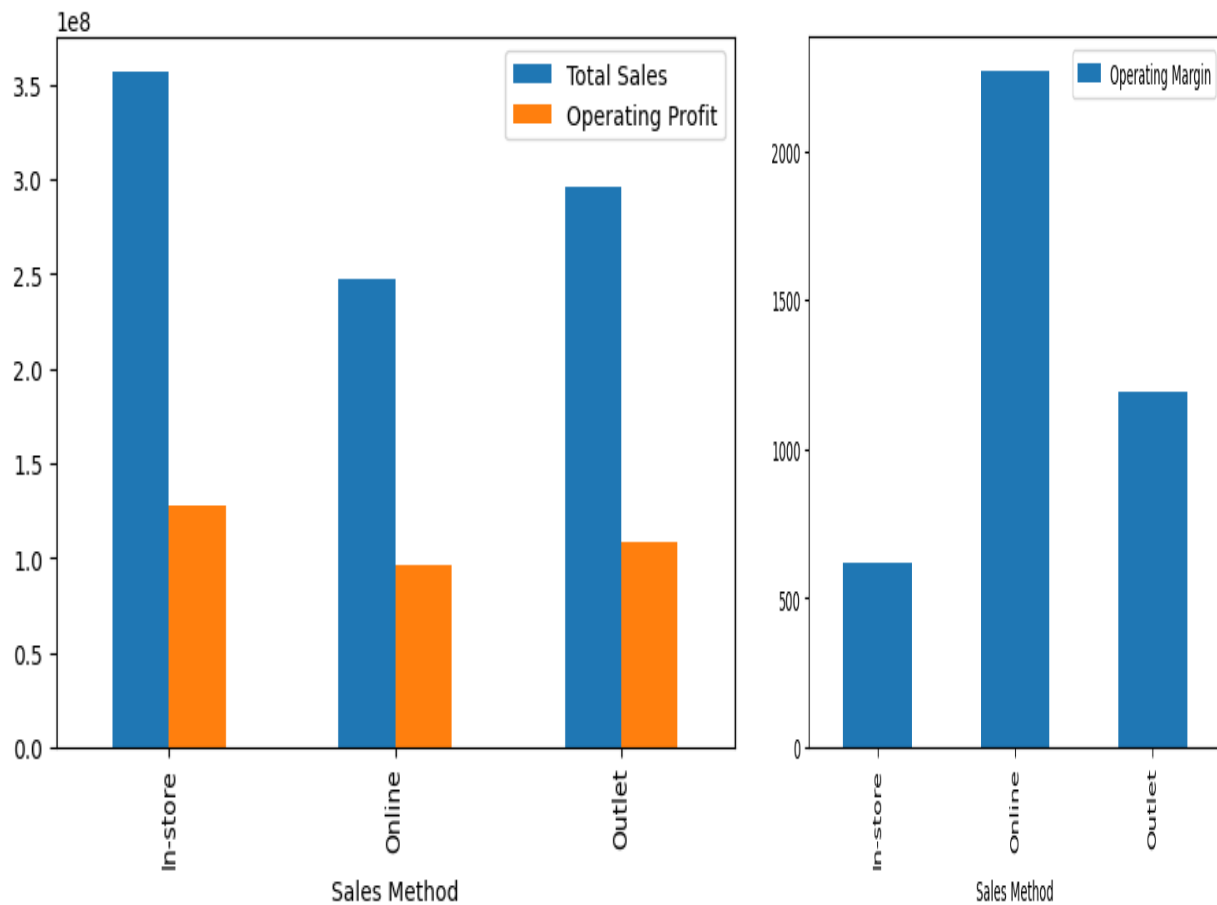
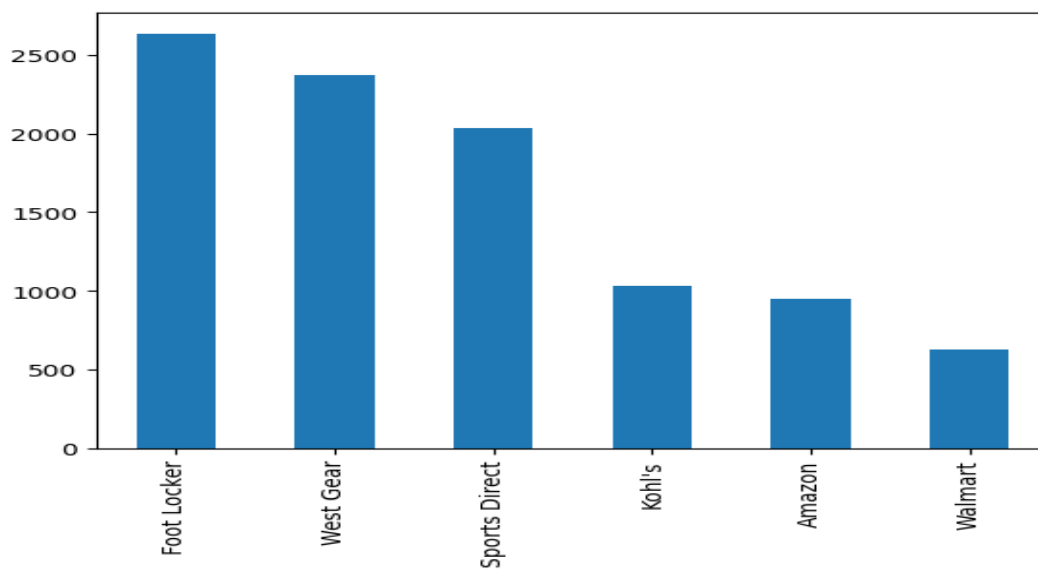4) Best and Worst Retailers based on Units Sold

Best – West Gear, SanFrancisco – 82655
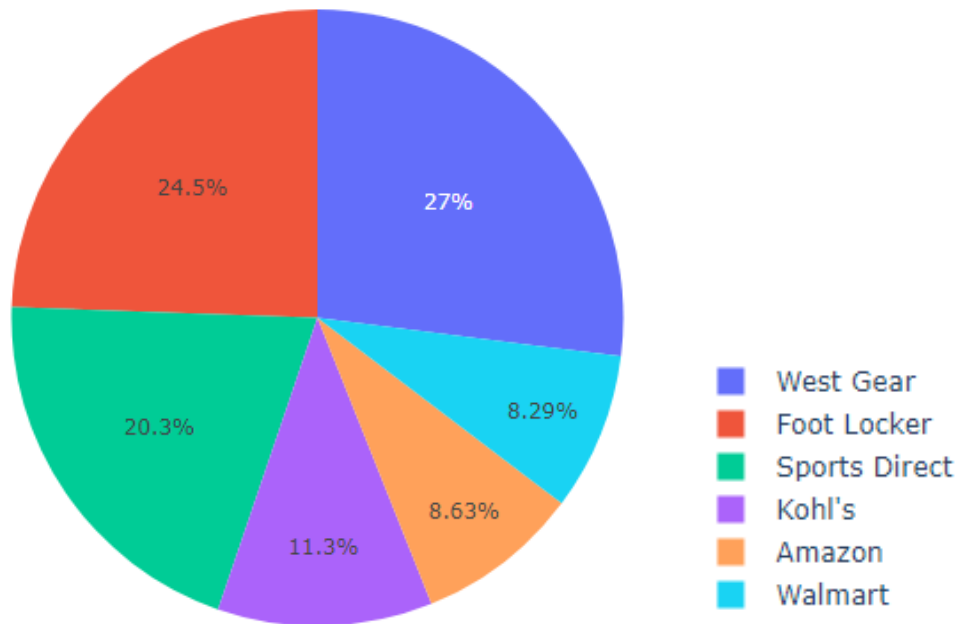
Worst – Foot Locker, Dallas- 1495

5) Most Selling - Price Range Product -(40,50]

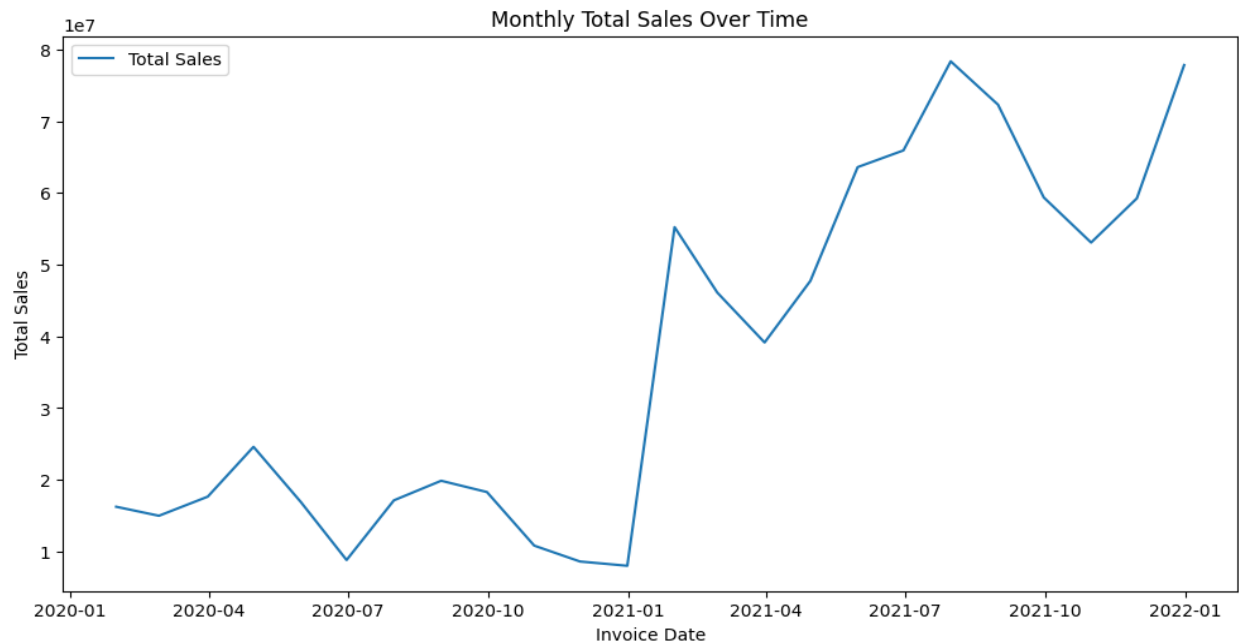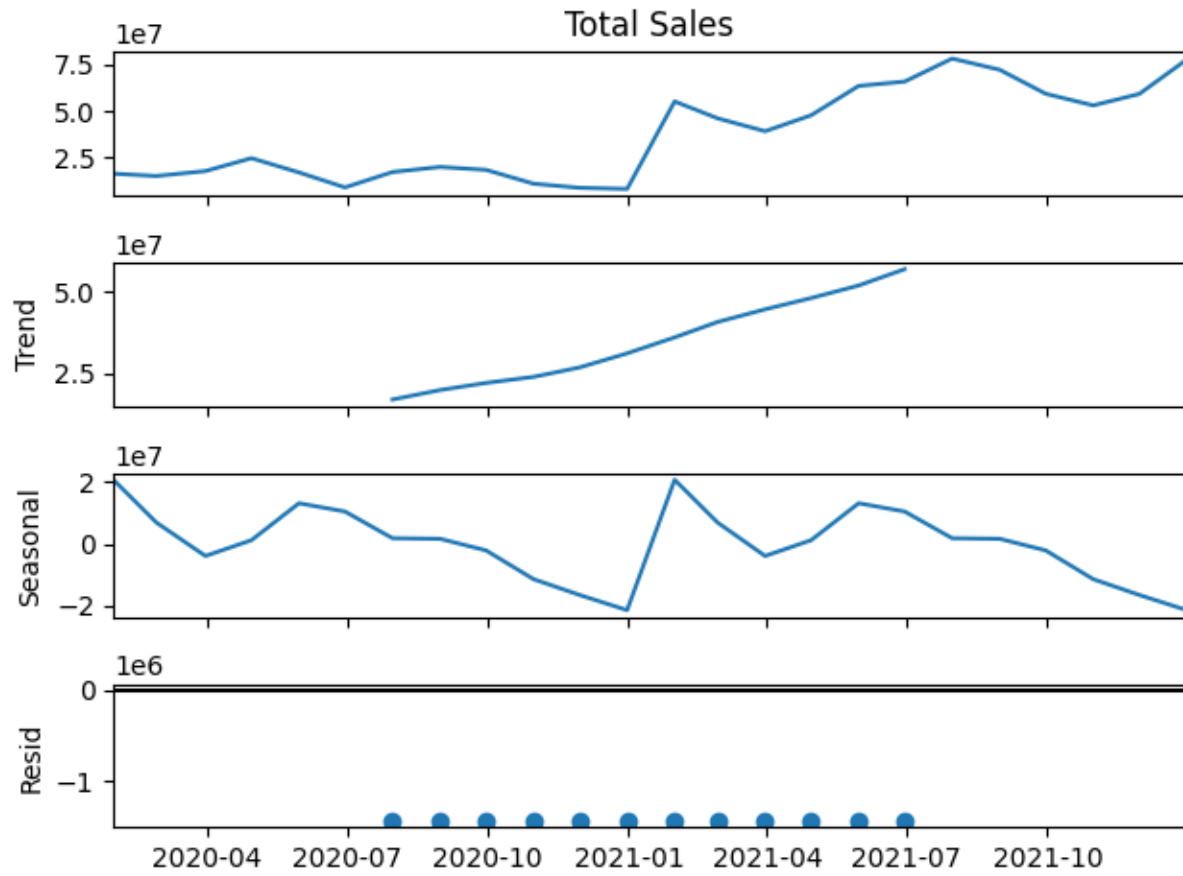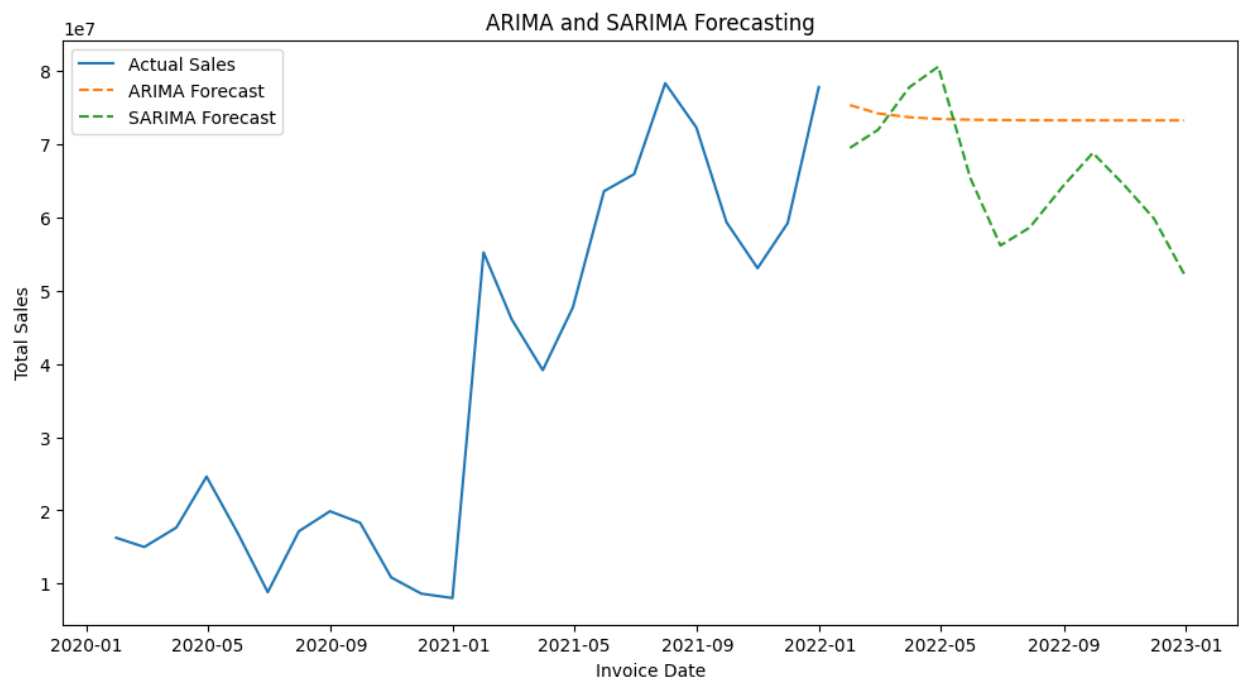## 6) Retailers - Outlet Count through out the world

7) Market Share of Retailers

8) Time Series Analysis for Sales Forecast

(I) Monthwise(01-2020 till 12-2021)- 2 years data

Total Sales

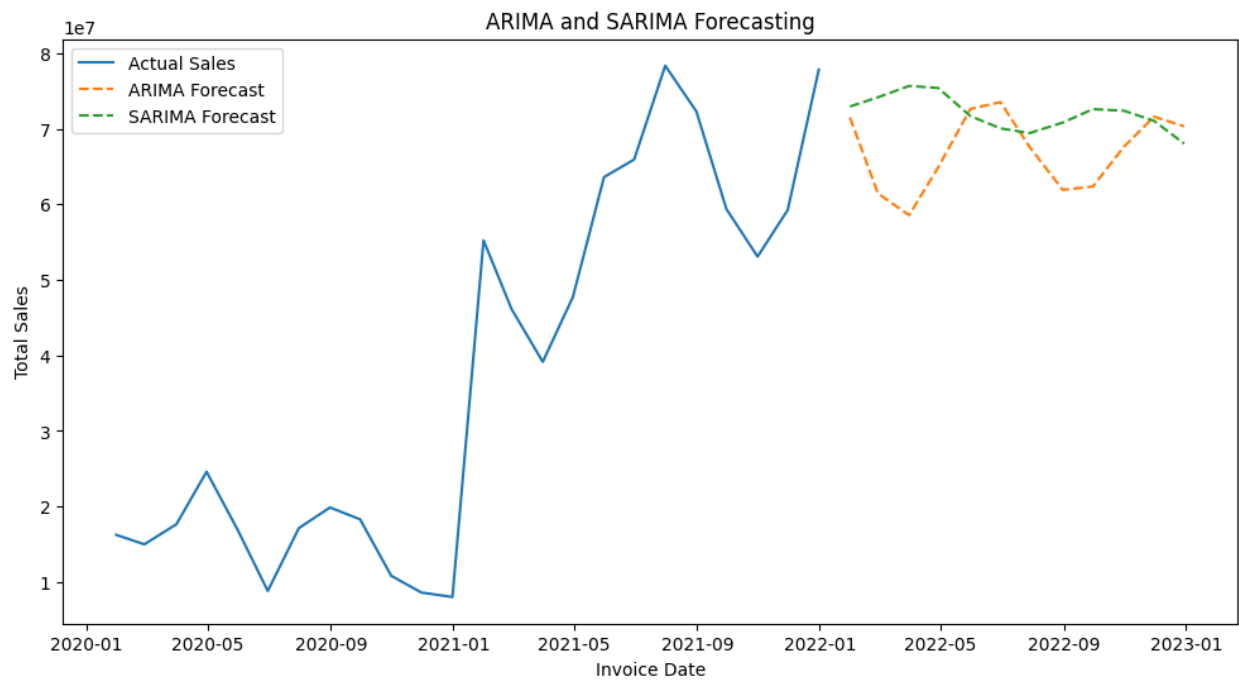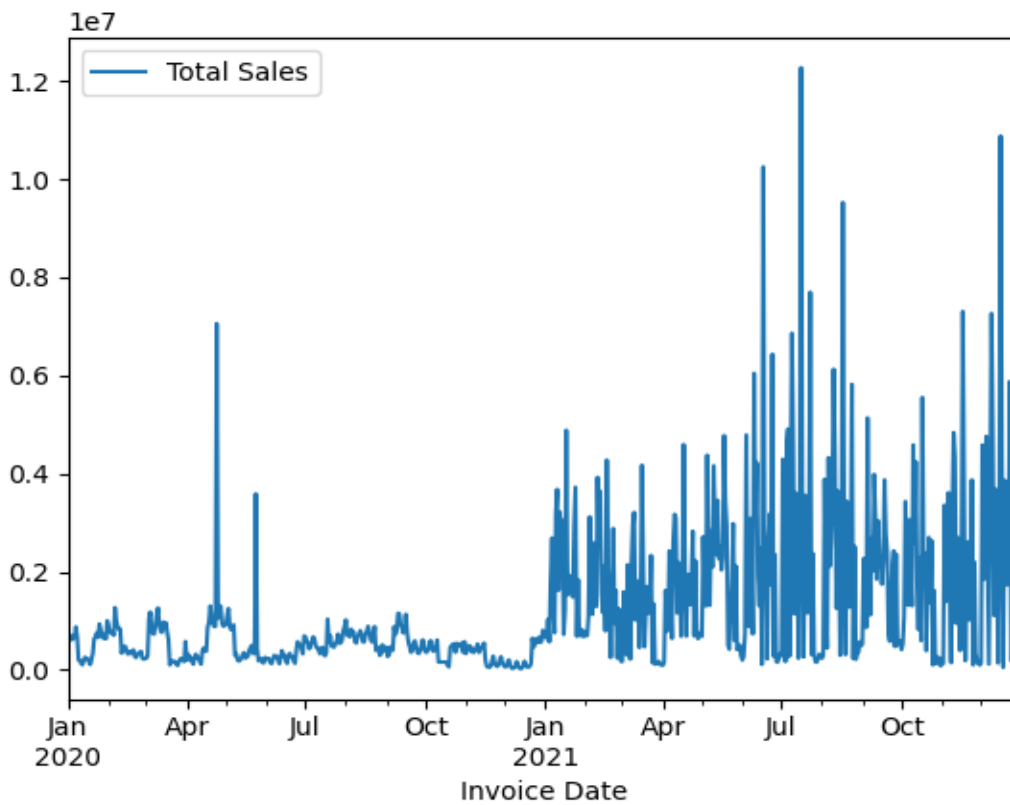SARIMAX(1,1,1,12)

ARIMA and SARIMA Forecasting
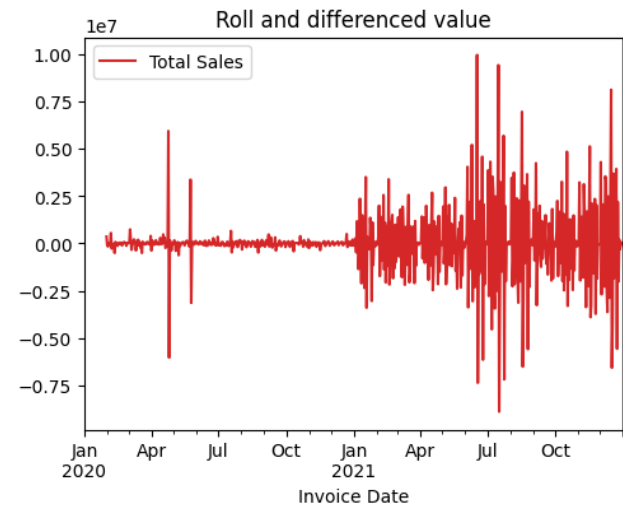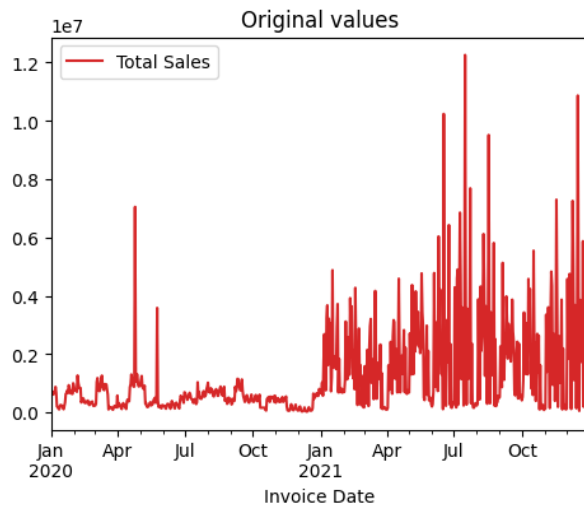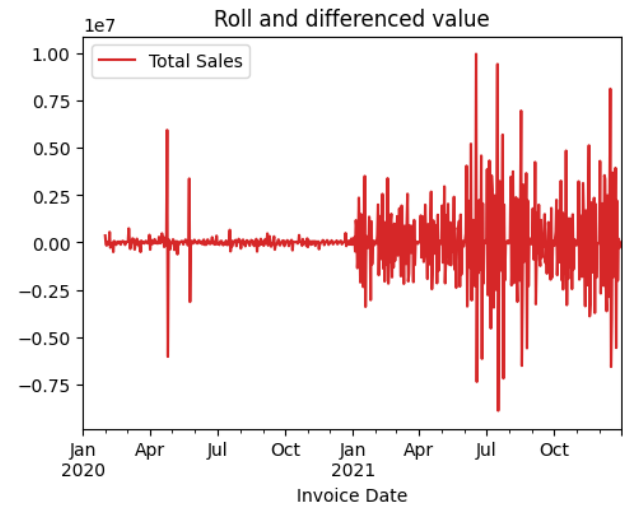
SARIMAX(2,1,2,12)

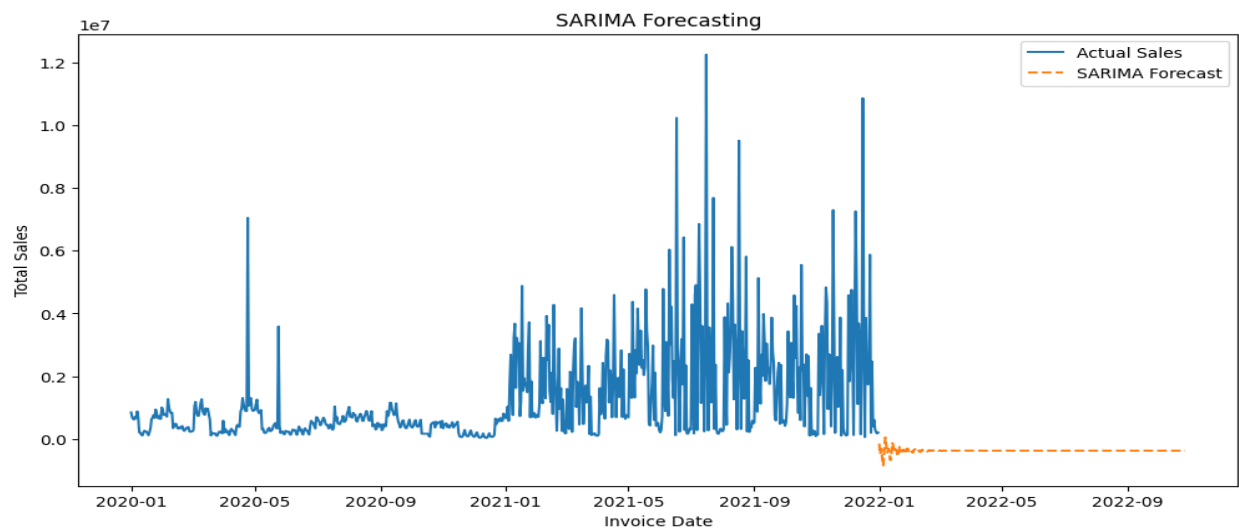ARIMA and SARIMA Forecasting

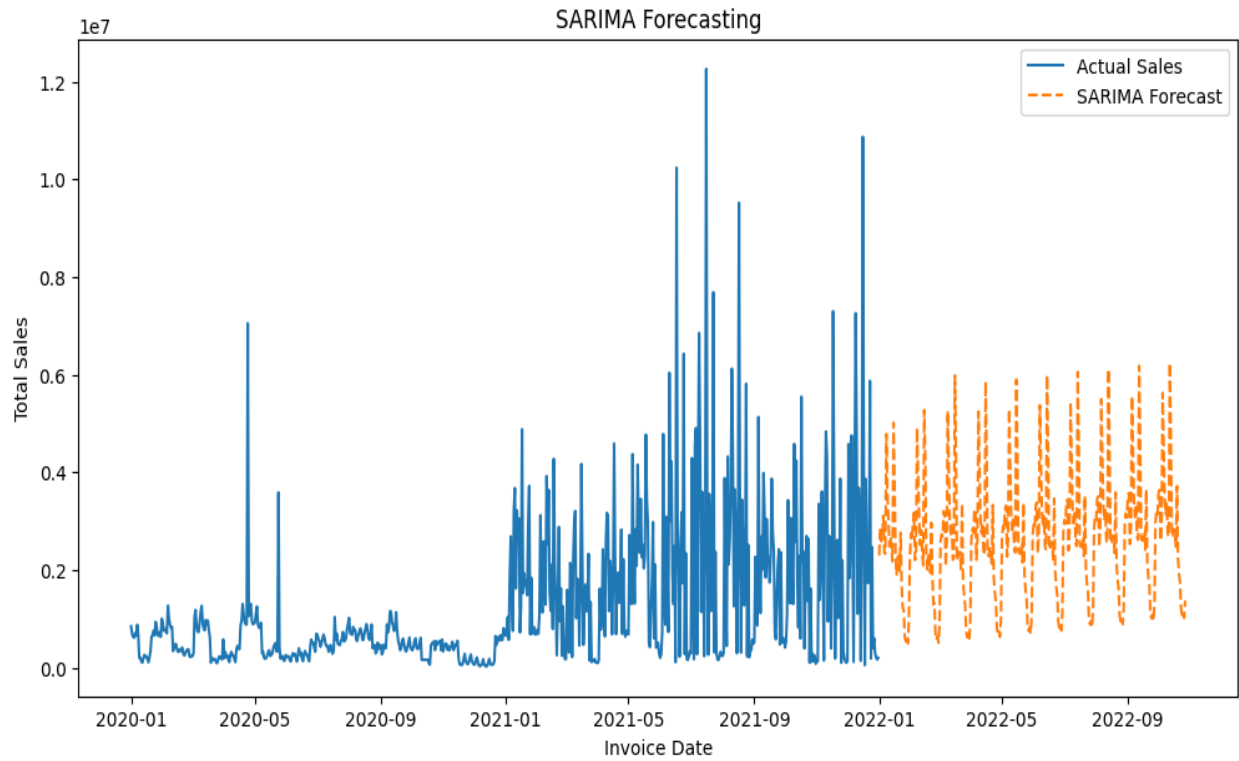(II) Day wise(01-01-2020 till 31-12-2021)-731 days

Rolling mean with 30 days window

Differenced with Rolling mean over 30 Days

Roll and differenced value

Original values

Roll and differenced value

SARIMAX(5,1,4,30)

SARIMA Forecasting

SARIMAX(2,1,2,30)

SARIMA Forecasting
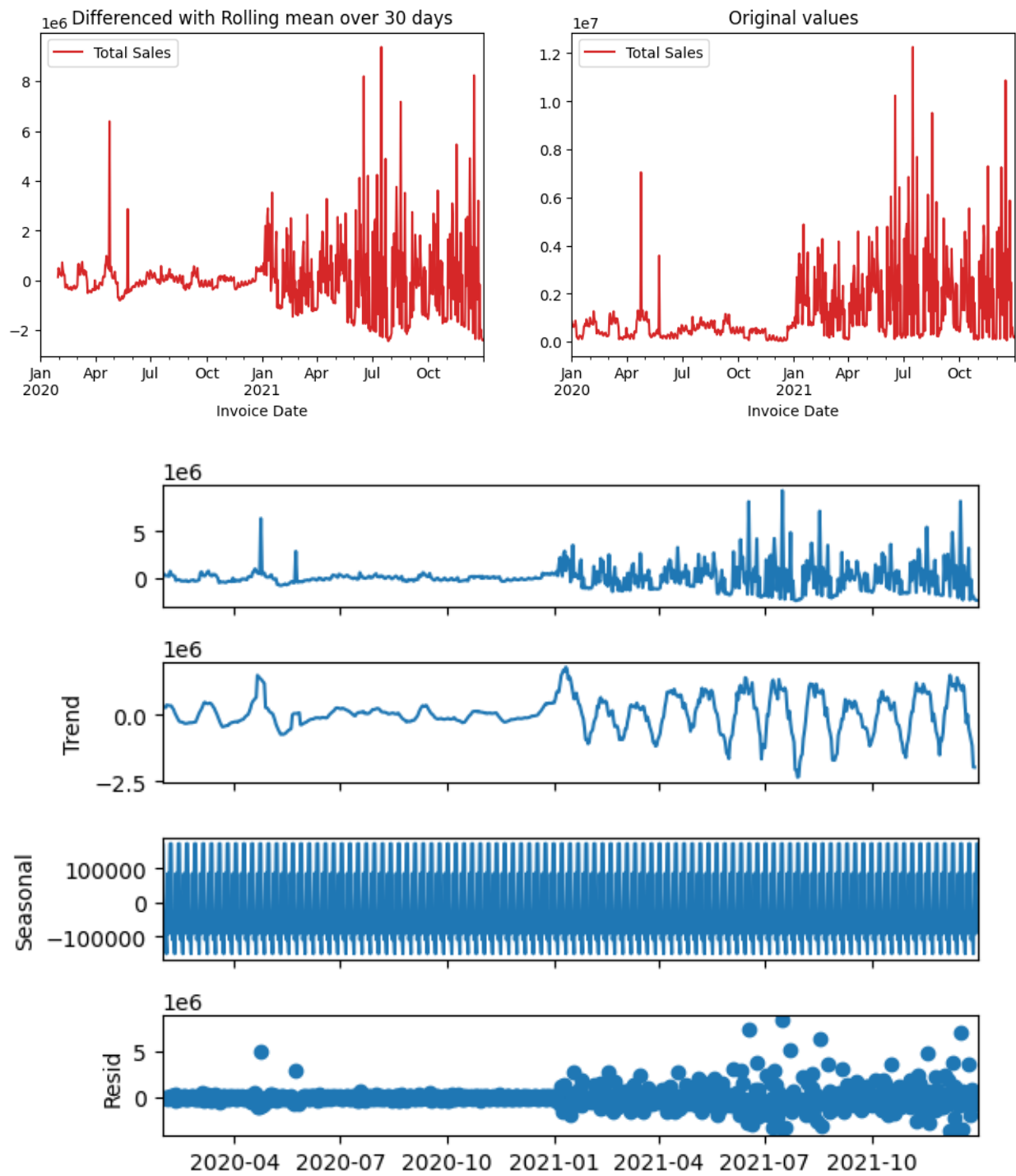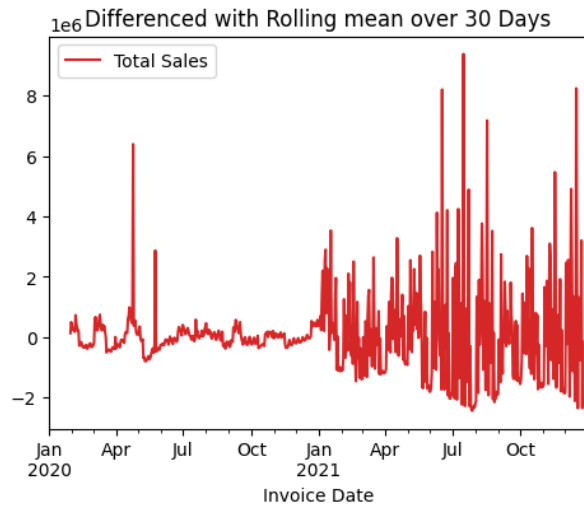
9) Total Sales and Units Sold monthwise

	Year	month	Total Sales	Units Sold
0	2020	1	16253746.0	48333
1	2020	2	14997988.0	37846
2	2020	3	17660577.0	46972
3	2020	4	24607006.0	54709
4	2020	5	16918014.0	35705
5	2020	6	8829819.0	16269
6	2020	7	17146013.0	38219
7	2020	8	19877980.0	62307
8	2020	9	18304436.0	46125
9	2020	10	10836269.0	30167
10	2020	11	8622300.0	25152
11	2020	12	8026527.0	20545
12	2021	1	55225396.0	179299
13	2021	2	46102165.0	156113
14	2021	3	39148532.0	143988
15	2021	4	47732964.0	161717
16	2021	5	63589681.0	178900
17	2021	6	65917553.0	164745
18	2021	7	78334681.0	180481
19	2021	8	72288221.0	195414
20	2021	9	59357023.0	182425
21	2021	10	53074764.0	152834
22	2021	11	59235040.0	149350
23	2021	12	77815430.0	171246

Total Sales by Product and Retailer