



College code:5113

Data analytics with cognos

Product Sales Analysis

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PHASE-4: DEVELOPMENT PART 2

PROJECT

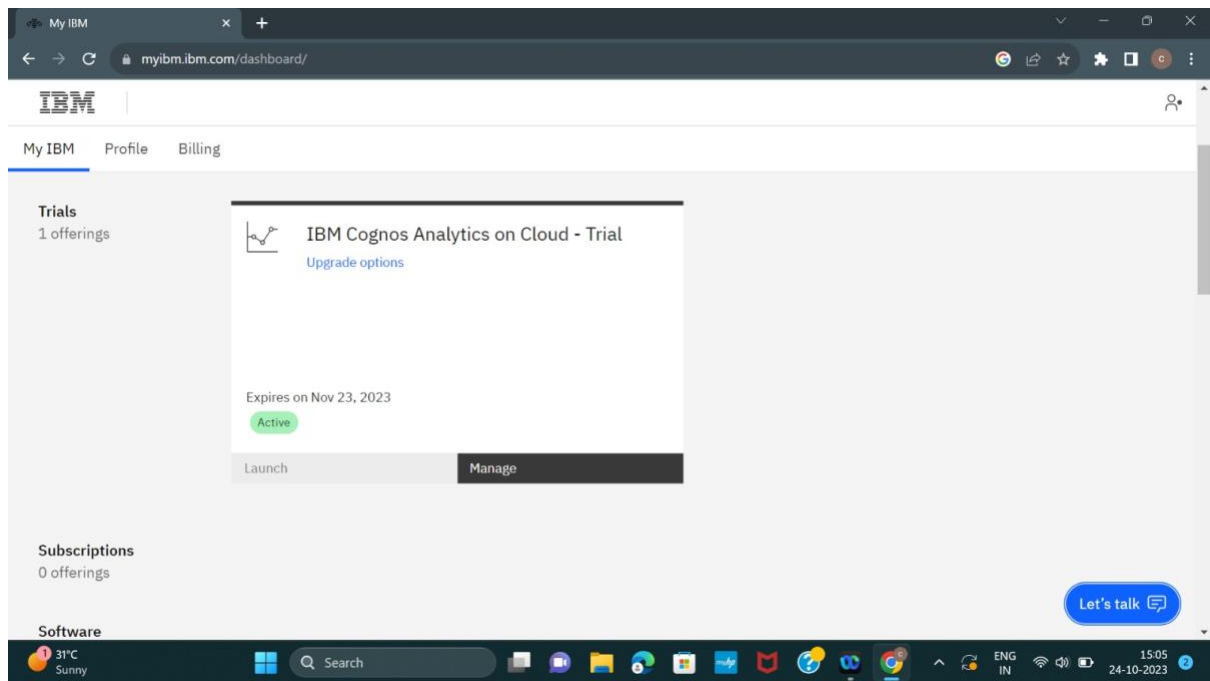
The aim of this project is to demonstrate the data analysis skills I've learned thus far and to apply them to real-world scenarios. As such, this project asks and answers real-world questions about real-world sales data. For instance, "What was the best month for sales?", or, "Which time of the day should we display advertisements to maximize the likelihood of customers' purchasing products?"

INTRODUCTION

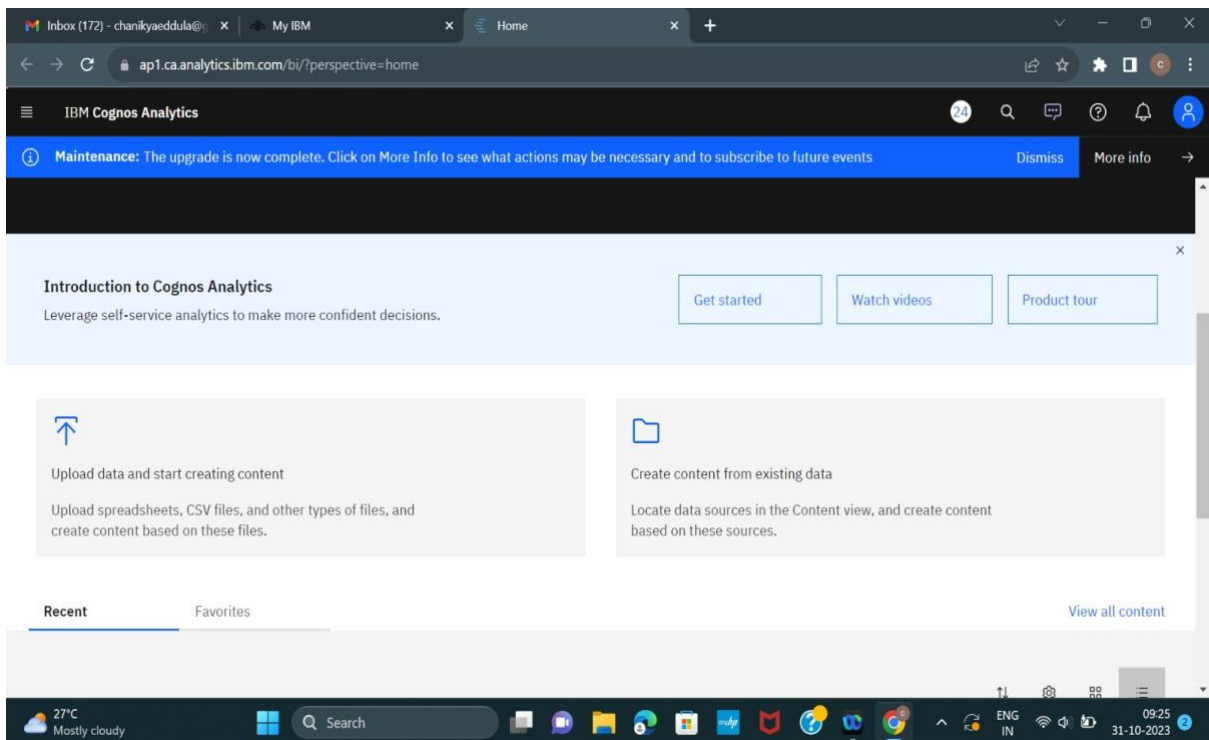
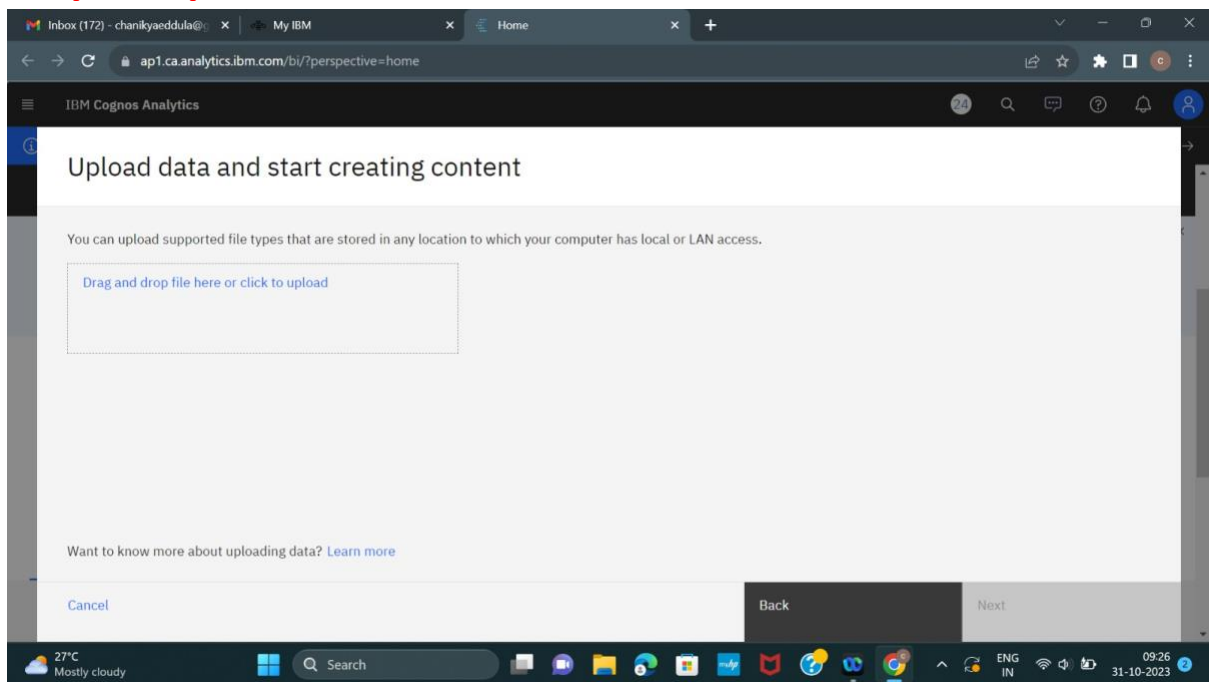
Product sales analysis of top-selling products is a critical aspect of any business's strategic planning and decision-making process. It involves the systematic examination of sales data and related information to gain valuable insights into the performance of a company's most popular and

profitable products. This analysis helps businesses understand various aspects of their top-selling products, such as their market share, customer preferences, sales trends, and overall impact on the company's bottom line.

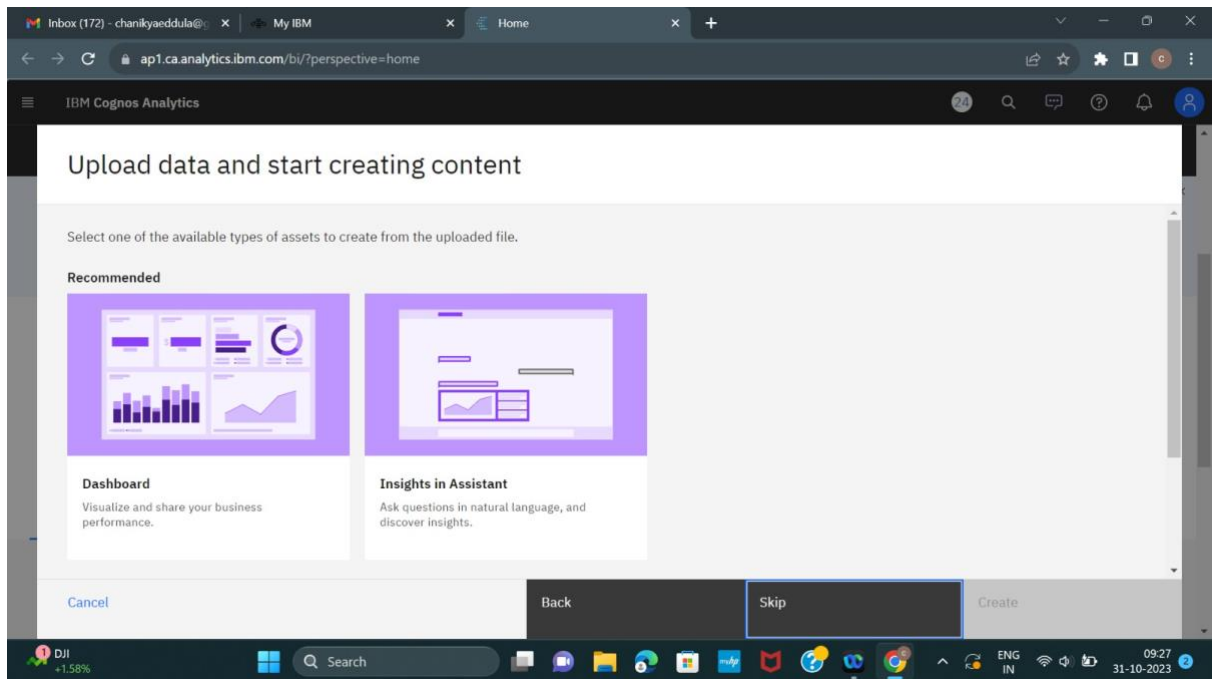
Step1: login IBM cognos account on cloud



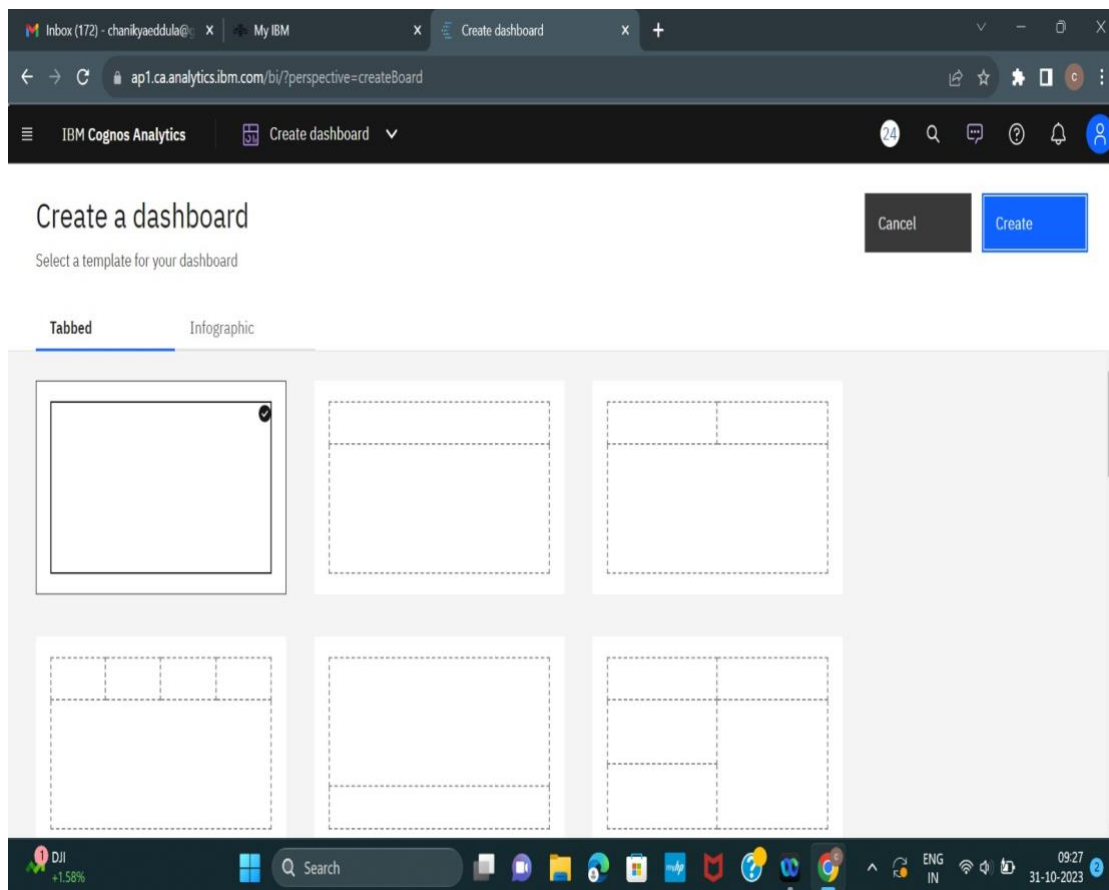
Step 2: Upload data in csv file



Step 3: drag and drop the file



step 4: creat a dash board template



Dash board of sales analysis of product

☐ Edit

No filters have been applied.

No filters have been applied.

Prior YTD [Profit]

Prior YTD [Quantity Sold]

- Prior Year [Profit]
- YTD [Profit]

Edit

Drag and drop data here to filter all tabs.

Drag and drop data here to filter this tab.

+

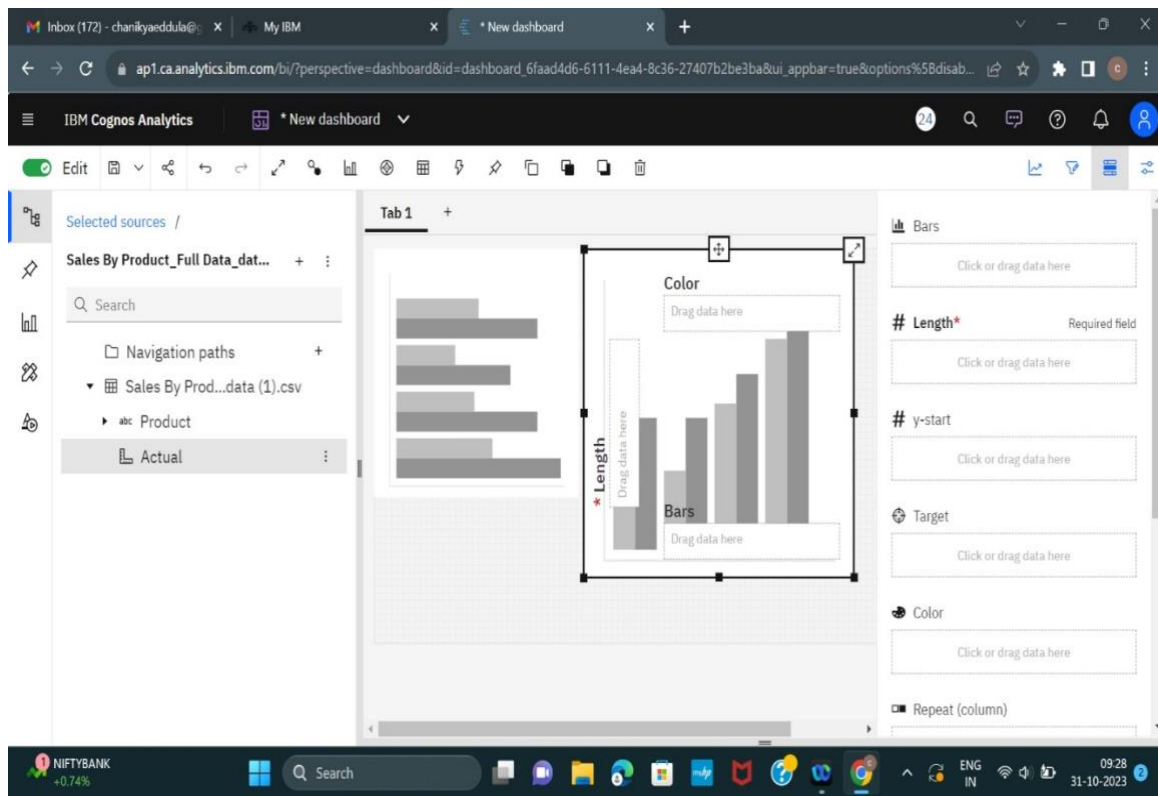
Column Line

● Sales (Sum) ● Engagement (Sum)



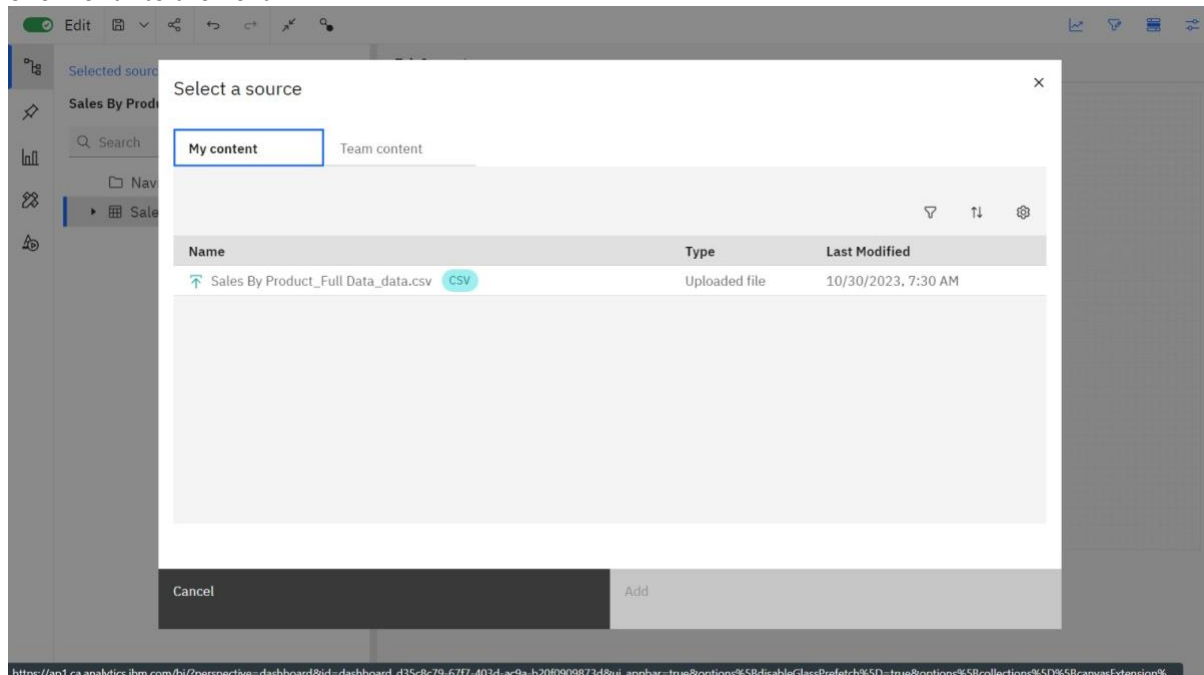
Step 6: here we to create visualizations of sales

Visualization of bar and column



after add the file in my contact source

one month to the next.



Exploring the Data

Question 1: What was the best month for sales? How much was earned that month?

Out[14]:

	Order ID	Product	Quantity Ordered	Price Each	Sales	Order Date	Months	Purchase Address
0	176558	USB-C Charging Cable	2	11.950000	23.900000	19/04/19 08:46	Apr	917 1st St, Dallas, TX 75001
1	176559	Bose SoundSport Headphones	1	99.989998	99.989998	07/04/19 22:30	Jul	682 Chestnut St, Boston, MA 02215
2	176560	Google Phone	1	600.000000	600.000000	12/04/19 14:38	Dec	669 Spruce St, Los Angeles, CA 90001
3	176560	Wired Headphones	1	11.990000	11.990000	12/04/19 14:38	Dec	669 Spruce St, Los Angeles, CA 90001
4	176561	Wired Headphones	1	11.990000	11.990000	30/04/19 09:27	Apr	333 8th St, Los Angeles, CA 90001

In [15]: *#Third, grouping the data by month and calculating the total sales (and quantities) amount for each month*
`sales_per_month = df.groupby(['Months']).sum()[['Quantity Ordered', 'Sales']]`

#sorting the data in alphabetical order by month name

#specifying the sorting order

`sort_order = ['Jan', 'Feb', 'Mar', 'Apr', 'May', 'Jun', 'Jul', 'Aug', 'Sep', 'Oct', 'Nov', 'Dec']`

#sorting the data

`sales_per_month = sales_per_month.reindex(sort_order)`

#to present the sales in USD and display them in a reader-friendly manner

`sales_per_month_USD = sales_per_month.copy()`

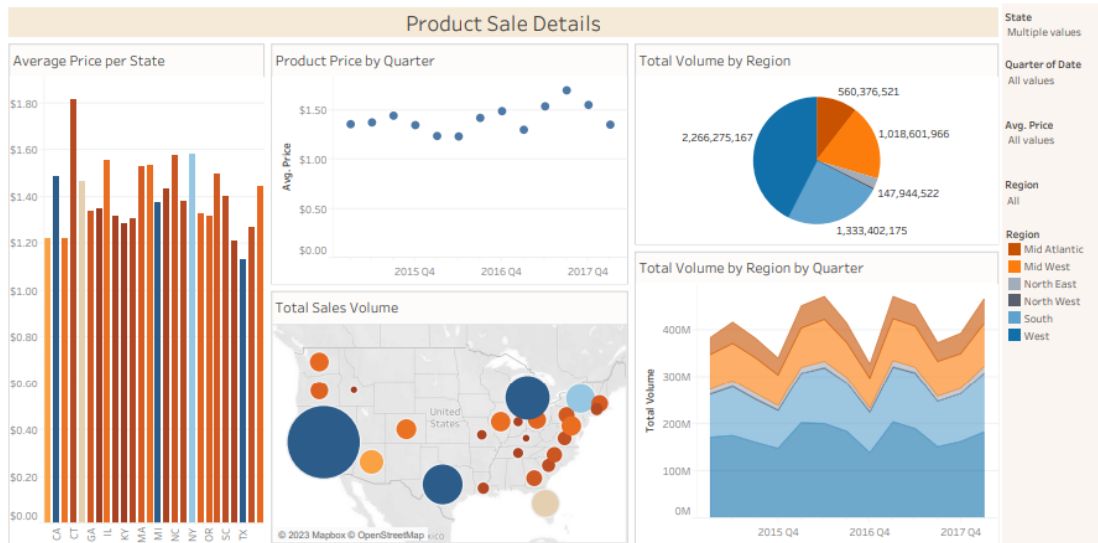
`sales_per_month_USD['Sales'] = sales_per_month_USD['Sales'].apply(lambda sale: '${:, .2f}'.format(sale))`

#displaying the results

`print('The following table displays the total sales amount (and quantities ordered) for each month:')`

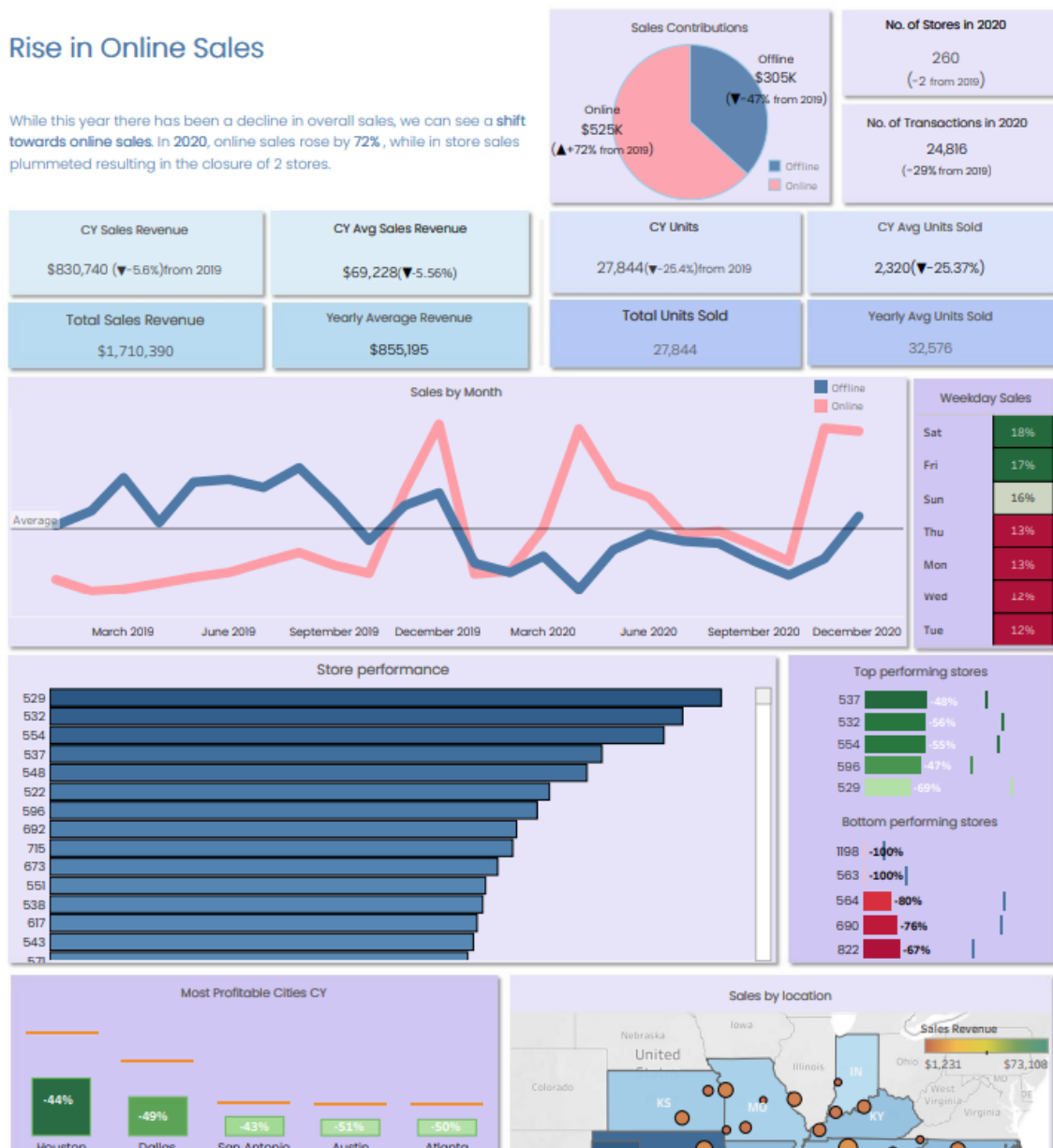
`sales_per_month_USD`

The following table displays the total sales amount (and quantities ordered) for each month:

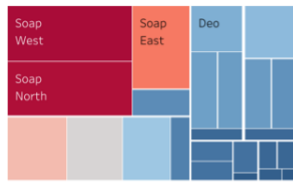


Rise in Online Sales

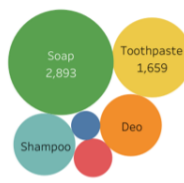
While this year there has been a decline in overall sales, we can see a **shift towards online sales**. In 2020, online sales rose by 72%, while in store sales plummeted resulting in the closure of 2 stores.



Region & Product by Size



Sales By Product

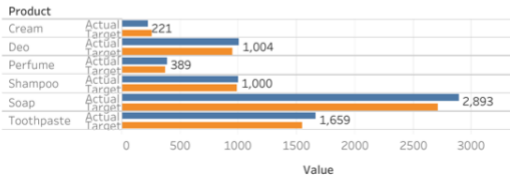


Measure Names
Actual
Target
Actual
25.0 999.4

Region
East
North
South
West

Product
Cream
Deo
Perfume
Shampoo
Soap
Toothpaste

Actual Vs Target (Region & Product)



Sales Volume by Region



AutoSave Off Sheet 3_Orders_data (5) - E... Saved to this PC Search Manoj E

File Home Insert Page Layout Formulas Data Review View Help

Clipboard Font Alignment Number Styles Cells Editing Add-ins

POSSIBLE DATA LOSS Some features might be lost if you save this workbook in the comma-delimited (.csv) format. To preserve these features, save it in an Excel file format. Don't show again Save As...

A1 Product Category

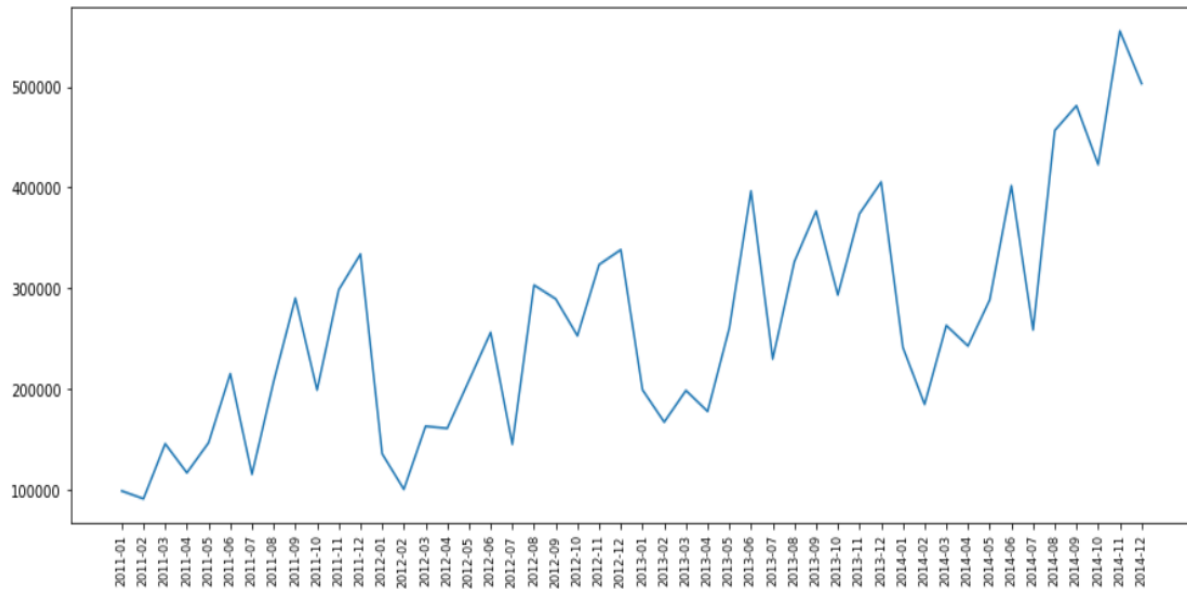
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	Product Category	Region	Sales	Unit Price																			
2	Furniture	West	6362.85	500.98																			
3	Furniture	East	211.15	9.48																			
4	Furniture	Central	1164.45	78.69																			
5	Furniture	West	455.77	26.48																			
6	Furniture	East	1876.69	26.48																			
7	Furniture	West	54.78	4.14																			
8	Furniture	East	1239.06	291.73																			
9	Furniture	East	4083.19	100.98																			
10	Furniture	East	5718.85	122.99																			
11	Furniture	East	1400.53	122.99																			
12	Furniture	East	1821.89	296.18																			
13	Furniture	East	90.98	8.09																			
14	Furniture	West	2875.72	296.18																			
15	Furniture	Central	6276.34	160.98																			
16	Furniture	Central	1526.68	160.98																			
17	Furniture	East	9459.94	300.98																			
18	Furniture	East	2441.27	300.98																			
19	Furniture	Central	10.23	1.74																			
20	Furniture	East	453.62	154.13																			
21	Furniture	Central	193.59	45.98																			
22	Furniture	Central	929.57	180.98																			
23	Furniture	South	667.84	79.52																			
24	Furniture	West	715.55	100.98																			
25	Furniture	East	64.75	20.28																			
26	Furniture	South	450.49	60.89																			

Sheet 3_Orders_data (5)

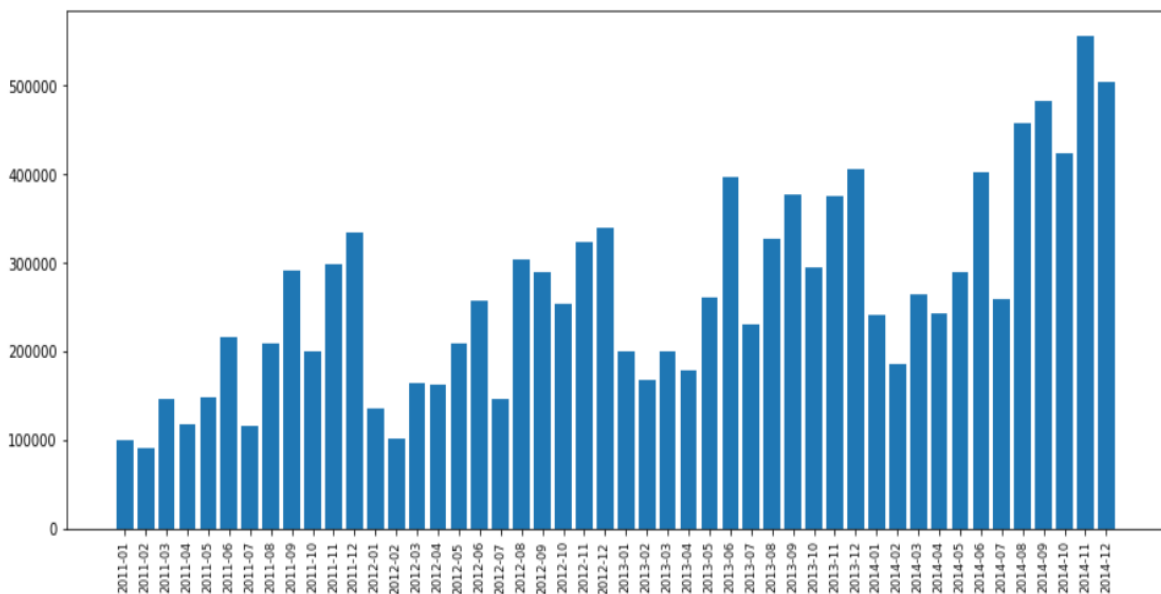
Ready Accessibility: Unavailable 100%

VISUALIZE SALES TRAND BY MONTHS

```
plt.figure(figsize=(15,6))
plt.plot(sales_by_month['month_year'],sales_by_month['sales'])
plt.xticks(rotation='vertical',size=8)
plt.show()
```



```
]: plt.figure(figsize=(15,6))
plt.bar(sales_by_month['month_year'],sales_by_month['sales'])
plt.xticks(rotation='vertical',size=8)
plt.show()
```



DISPLAY MOST SELLING PRODCUTS

```
In [22]: products_sales = pd.DataFrame(sales.groupby('product_name').sum()['sales'])
products_sales = products_sales.sort_values('sales',ascending=False)
```

TOP 10 MOST SALES PRODUCTS

```
In [23]: products_sales[:10]
```

```
Out[23]:
```

	sales
product_name	
Apple Smart Phone, Full Size	86935.7786
Cisco Smart Phone, Full Size	76441.5306
Motorola Smart Phone, Full Size	73156.3030
Nokia Smart Phone, Full Size	71904.5555
Canon imageCLASS 2200 Advanced Copier	61599.8240
Hon Executive Leather Armchair, Adjustable	58193.4841
Office Star Executive Leather Armchair, Adjustable	50661.6840
Harbour Creations Executive Leather Armchair, Adjustable	50121.5160
Samsung Smart Phone, Cordless	48653.4600
Nokia Smart Phone, with Caller ID	47877.7857

```
: products_by_quantity = pd.DataFrame(sales.groupby('product_name').sum()['quantity'])
products_by_quantity_sorted = products_by_quantity.sort_values('quantity',ascending=False)
```

TOP 10 MOST QUANTITY SELLING PRODUCTS ITEMS

```
: products_by_quantity_sorted[:10]
```

```
:
```

	quantity
product_name	
Staples	876
Cardinal Index Tab, Clear	337
Eldon File Cart, Single Width	321
Rogers File Cart, Single Width	262
Sanford Pencil Sharpener, Water Color	259
Stockwell Paper Clips, Assorted Sizes	253
Avery Index Tab, Clear	252
Ibico Index Tab, Clear	251
Smead File Cart, Single Width	250
Stanley Pencil Sharpener, Water Color	242

VISUALIZE MOST USED SHIP MODS

```
In [14]: sales.isnull().sum()
```

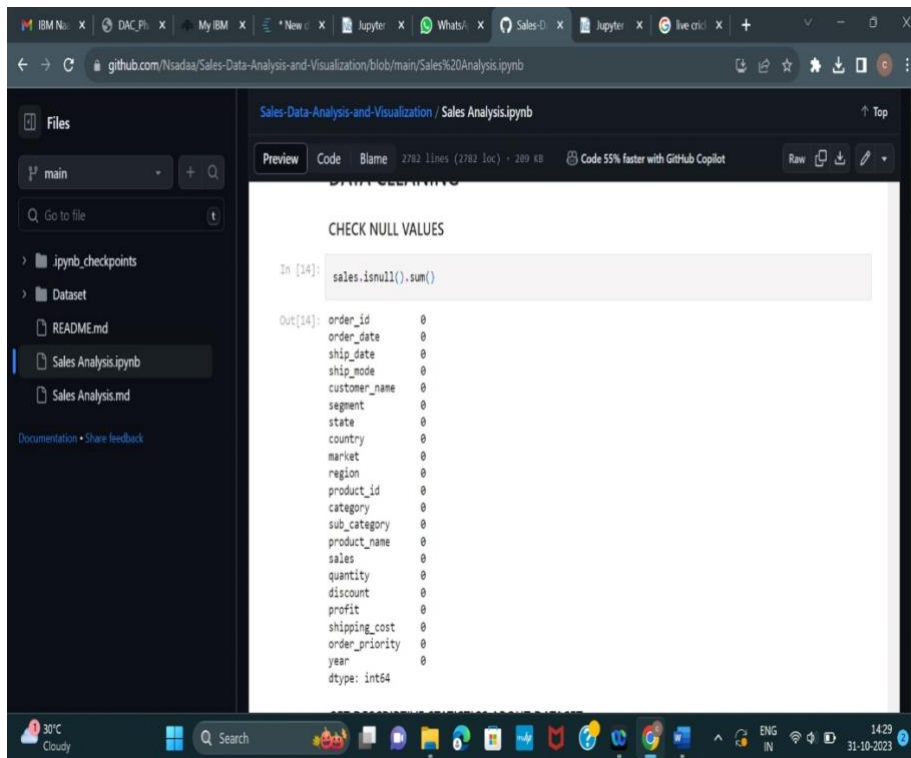
```
Out[14]: order_id      0
order_date    0
ship_date     0
ship_mode     0
customer_name  0
segment       0
state         0
country       0
market        0
region        0
product_id    0
category      0
sub_category  0
product_name  0
sales         0
quantity      0
discount      0
profit        0
shipping_cost 0
order_priority 0
year          0
dtype: int64
```

GET INFORMATIONS ABOUT DATASET

```
[13]: sales.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51290 entries, 0 to 51289
Data columns (total 21 columns):
#   Column                Non-Null Count  Dtype
---  ---
0   order_id              51290 non-null  object
1   order_date            51290 non-null  datetime64[ns]
2   ship_date             51290 non-null  datetime64[ns]
3   ship_mode             51290 non-null  object
4   customer_name         51290 non-null  object
5   segment              51290 non-null  object
6   state                51290 non-null  object
7   country              51290 non-null  object
8   market               51290 non-null  object
9   region               51290 non-null  object
10  product_id           51290 non-null  object
11  category             51290 non-null  object
12  sub_category         51290 non-null  object
13  product_name         51290 non-null  object
14  sales                51290 non-null  float64
15  quantity             51290 non-null  int64
16  discount             51290 non-null  float64
17  profit               51290 non-null  float64
18  shipping_cost        51290 non-null  float64
19  order_priority       51290 non-null  object
20  year                51290 non-null  int64
dtypes: datetime64[ns](2), float64(4), int64(2), object(13)
memory usage: 8.2+ MB
```

DATA CLEANING



GETTING KNOW ABOUT DATSET SHAPE & COLUMNS

```
In [11]: sales.shape
```

```
Out[11]: (51290, 21)
```

```
In [12]: for columns in sales.columns:  
         print(columns)
```

```
order_id  
order_date  
ship_date  
ship_mode  
customer_name  
segment  
state  
country  
market  
region  
product_id  
category  
sub_category  
product_name  
sales  
quantity  
discount  
profit  
shipping_cost  
order_priority  
year
```

GET INFORMATIONS ABOUT DATASET

Sales and profit trend



Conclusion : In this document we have seen using IBM cognos to design interactive dashboards and reports that display such as top-selling products , sales trends ,and customer preferences and from the visualizations ,such as identifying poducts with the highest sales , peak sales periods.