WEBSITE TRAFFIC ANALYSIS

PHASE 3 : DEVELOPMENT PART 1

PRIYADARSHINI ENGINEERING COLLEGE

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INTRODUCTION:

Website traffic analysis is the process of collecting, examining, and interpreting data related to the visitors and interactions on a website. It provides invaluable insights into user behavior, preferences, and trends, helping organizations make informed decisions, optimize their online presence, and enhance user experiences.

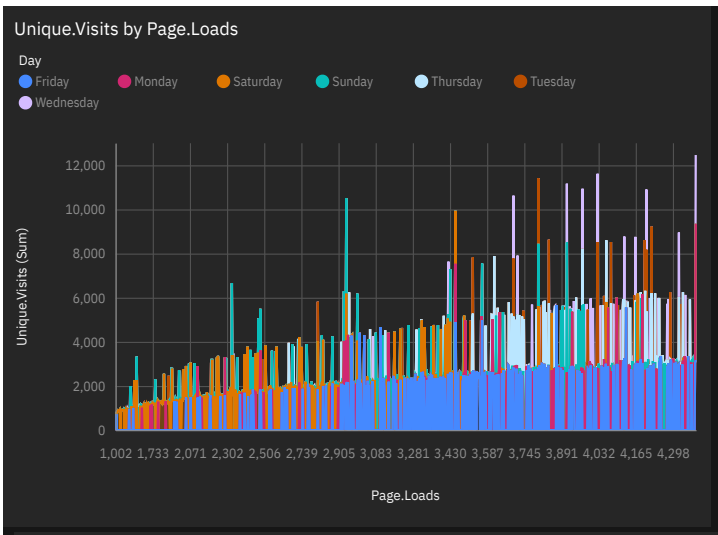
Abstract:

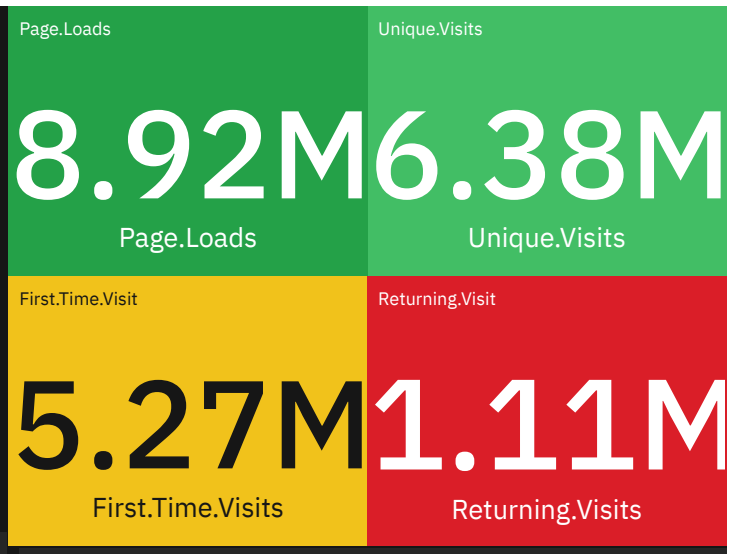
This project aims to analyze website traffic data for insights into user behavior, popular pages, and traffic sources. It involves data collection, visualization using IBM Cognos, and Python for advanced analysis. The goal is to optimize user experiences and enhance website performance.

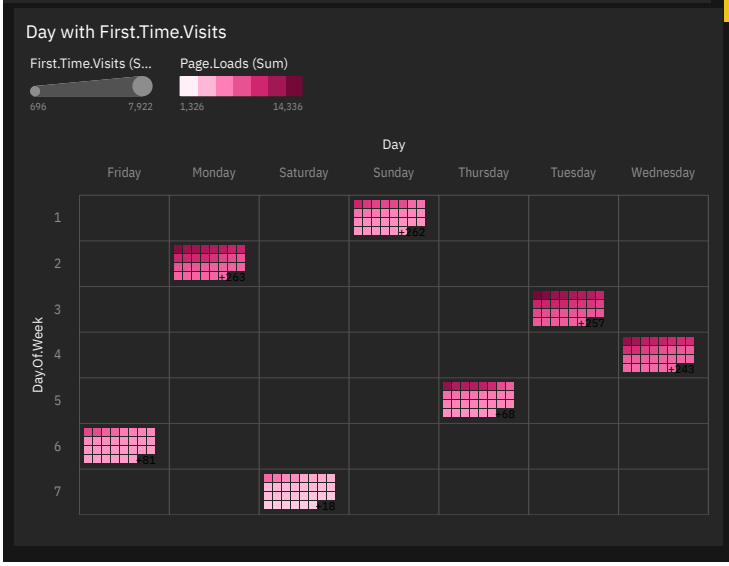
Problem Statement:

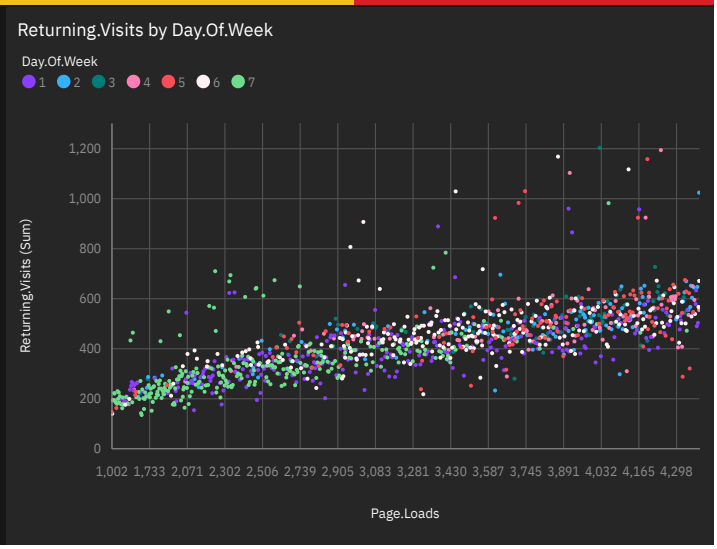
The problem of "Website Traffic Analysis" lies in the need for organizations to effectively understand and leverage user behavior on their websites

Tab 1

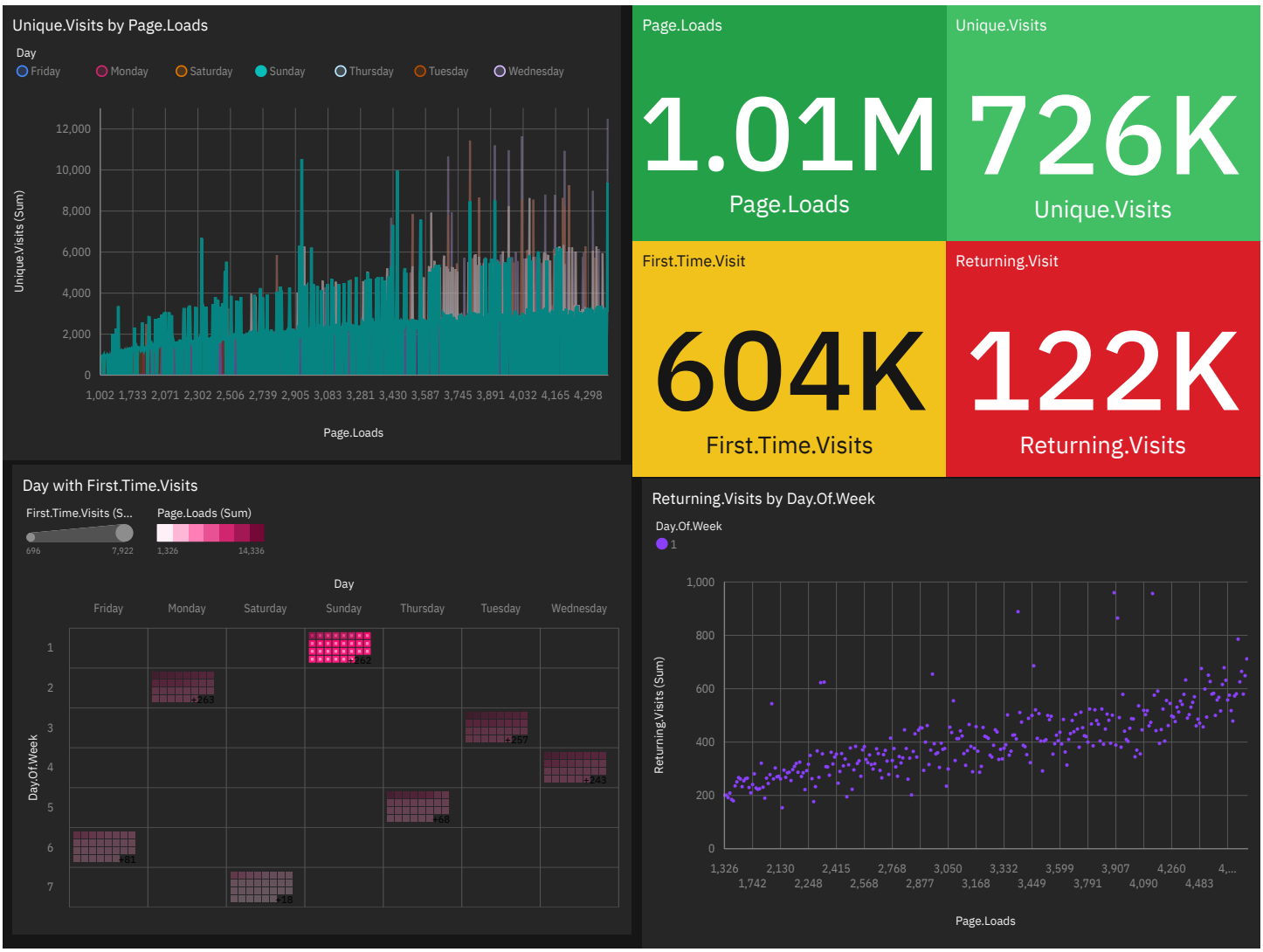

Unique.Visits by Page.Loads
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Unique.Visits (Sum)
12,000
10,000
8,000
6,000
4,000
2,000
0
1,002 1,733 2,071 2,302 2,506 2,739 2,905 3,083 3,281 3,430 3,587 3,745 3,891 4,032 4,165 4,298
Page.Loads


Page.Loads
8.92M
Page.Loads
Unique.Visits
6.38M
Unique.Visits
First.Time.Visit
5.27M
First.Time.Visits
Returning.Visit
1.11M
Returning.Visits

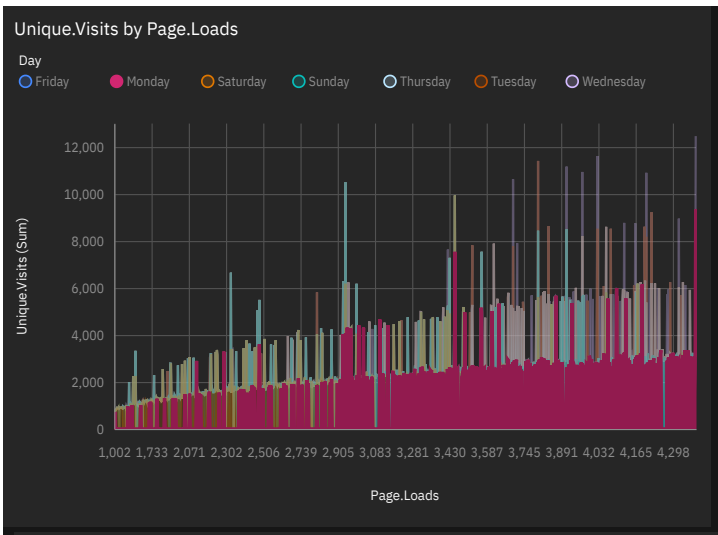

Day with First.Time.Visits
First.Time.Visits (S...
696
7,922
Page.Loads (Sum)
1,326
14,336
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Day.Of.Week
1
2
3
4
5
6
7

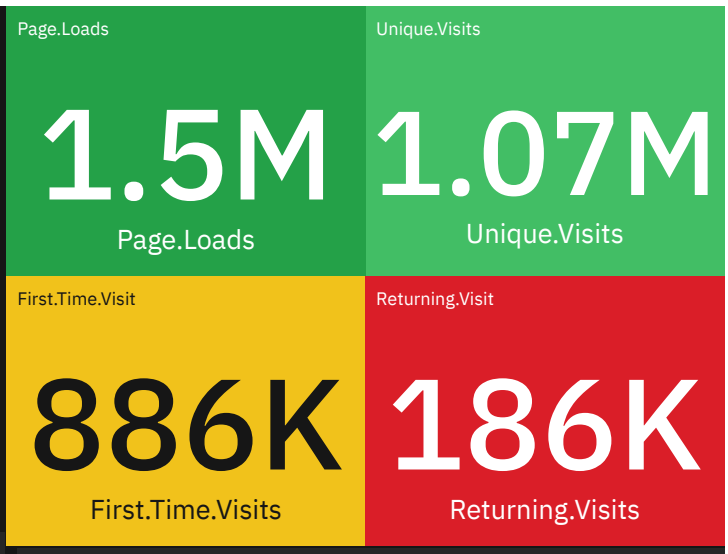

Returning.Visits by Day.Of.Week
Day.Of.Week
1
2
3
4
5
6
7
Returning.Visits (Sum)
1,200
1,000
800
600
400
200
0
1,002 1,733 2,071 2,302 2,506 2,739 2,905 3,083 3,281 3,430 3,587 3,745 3,891 4,032 4,165 4,298
Page.Loads

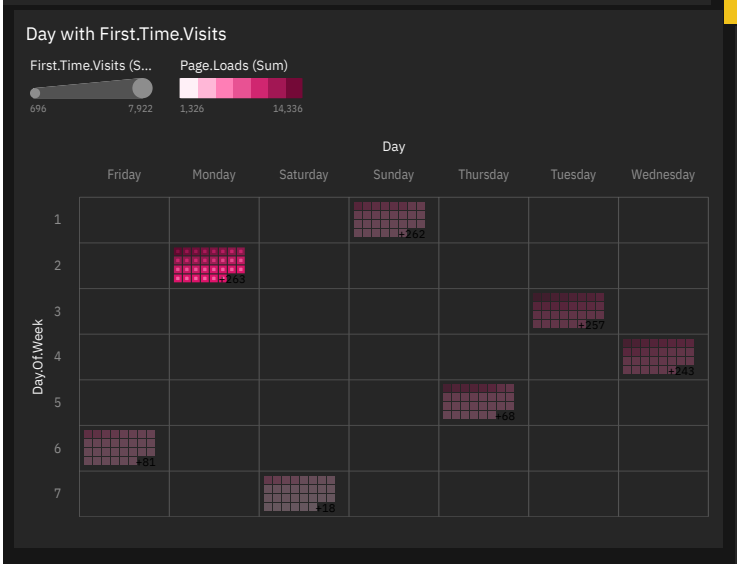
Tab 1

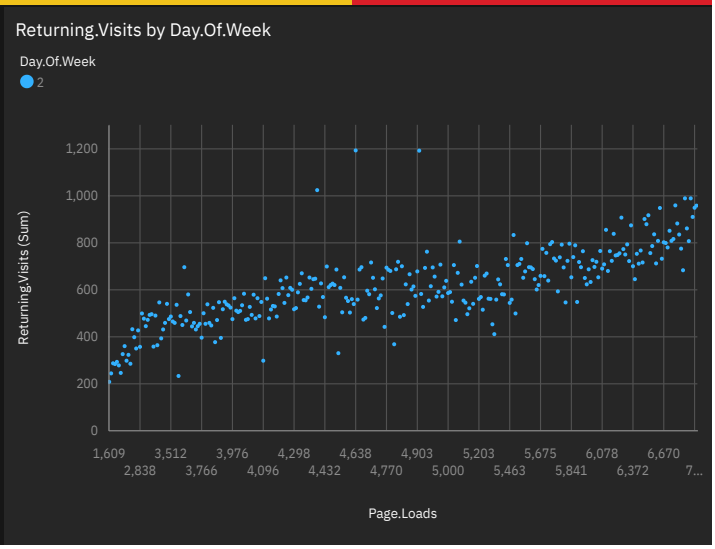

Unique.Visits by Page.Loads
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Unique.Visits (Sum)
12,000
10,000
8,000
6,000
4,000
2,000
0
1,002 1,733 2,071 2,302 2,506 2,739 2,905 3,083 3,281 3,430 3,587 3,745 3,891 4,032 4,165 4,298
Page.Loads
Page.Loads
1.01M
Page.Loads
Unique.Visits
726K
Unique.Visits
First.Time.Visit
604K
First.Time.Visits
Returning.Visit
122K
Returning.Visits
Day with First.Time.Visits
First.Time.Visits (S...
696
7,922
Page.Loads (Sum)
1,326
14,336
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Day.Of.Week
1
2
3
4
5
6
7
+262
+263
+257
+243
+68
+81
+48
Returning.Visits by Day.Of.Week
Day.Of.Week
1
Returning.Visits (Sum)
1,000
800
600
400
200
0
1,326 2,130 2,415 2,768 3,050 3,332 3,599 3,907 4,260 4,...
1,742 2,248 2,568 2,877 3,168 3,449 3,791 4,090 4,483
Page.Loads

Tab 1

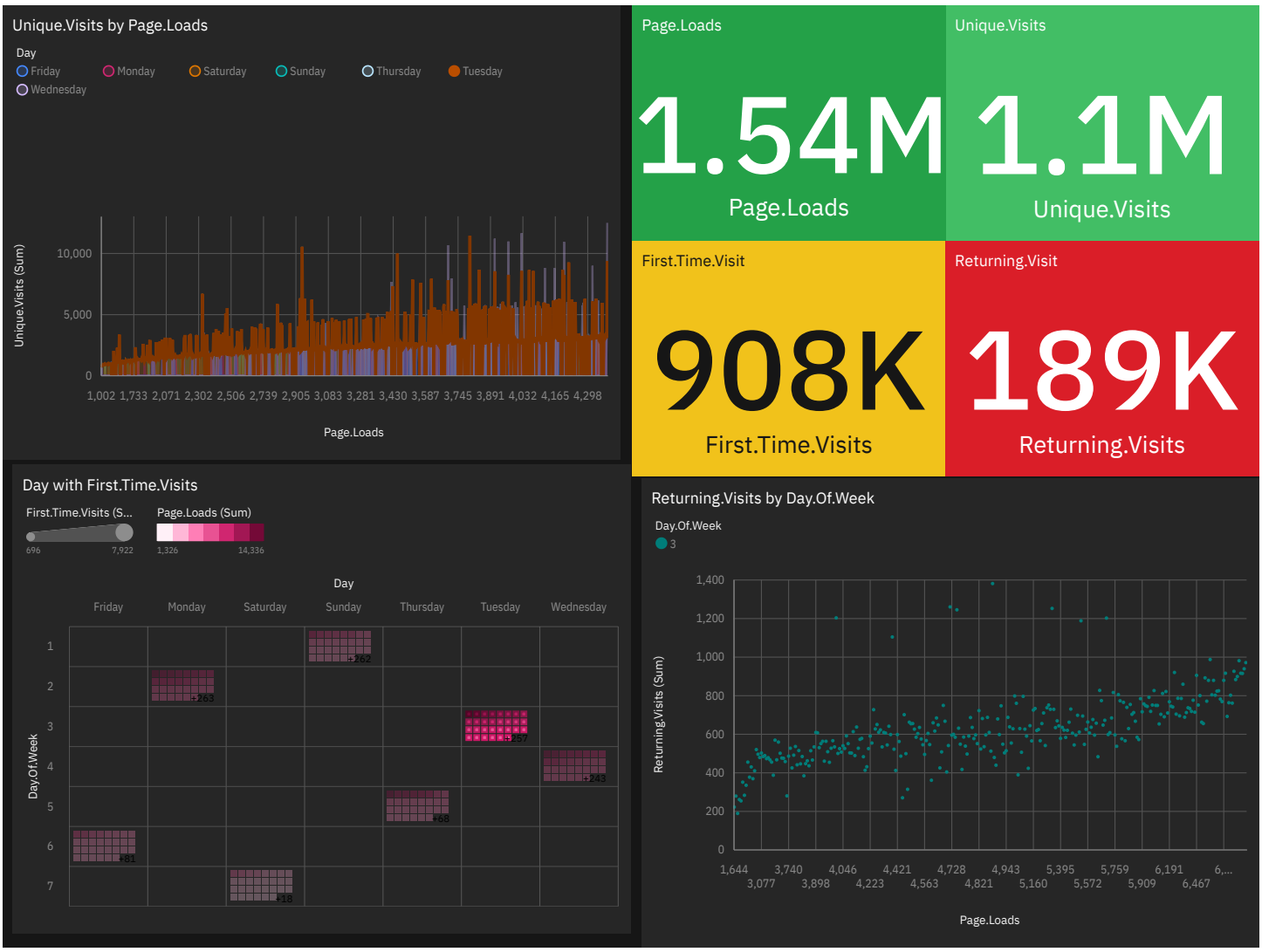

Unique.Visits by Page.Loads
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Unique.Visits (Sum)
12,000
10,000
8,000
6,000
4,000
2,000
0
1,002 1,733 2,071 2,302 2,506 2,739 2,905 3,083 3,281 3,430 3,587 3,745 3,891 4,032 4,165 4,298
Page.Loads


Page.Loads
1.5M
Page.Loads
Unique.Visits
1.07M
Unique.Visits
First.Time.Visit
886K
First.Time.Visits
Returning.Visit
186K
Returning.Visits

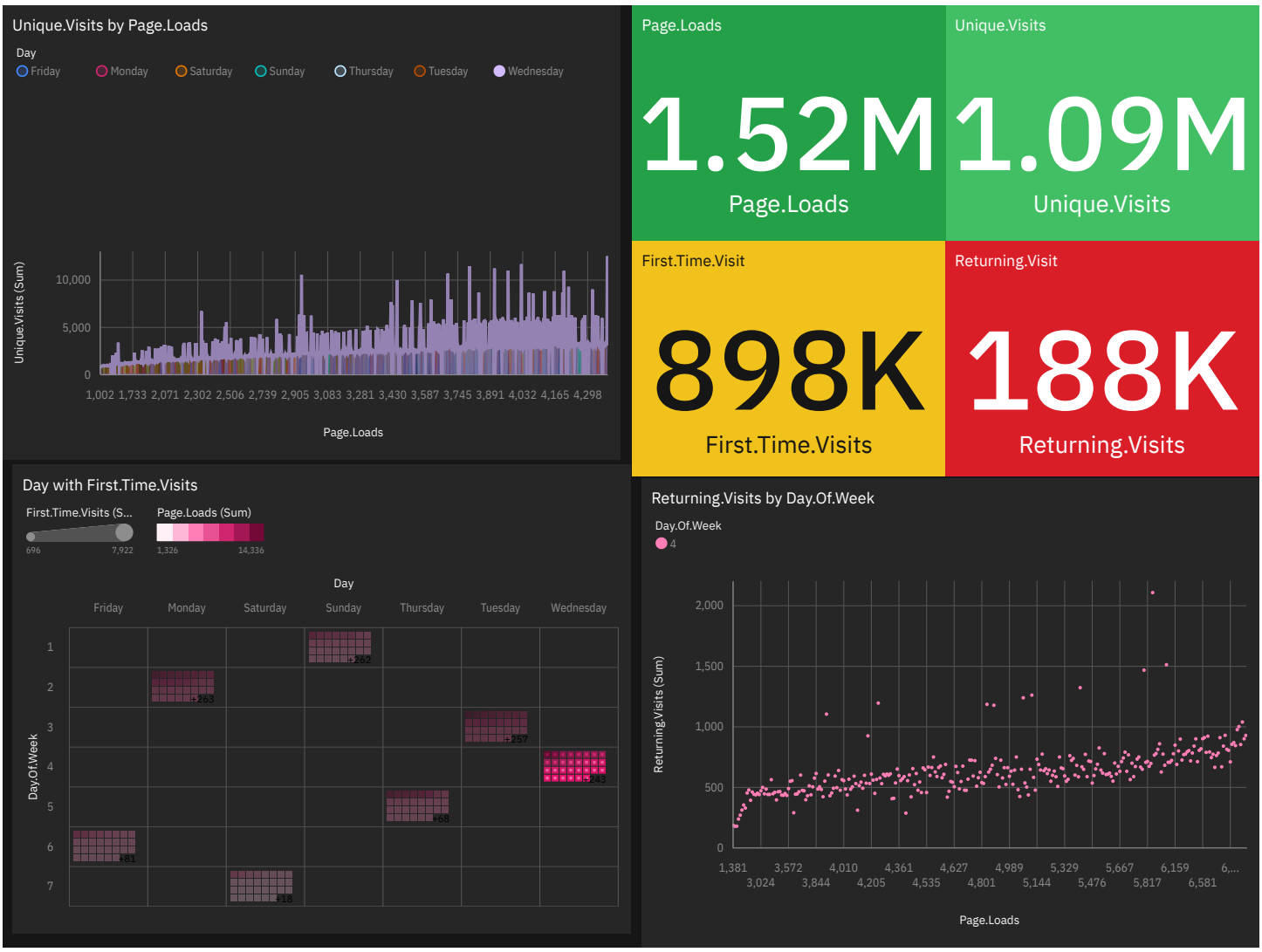

Day with First.Time.Visits
First.Time.Visits (S...
696
7,922
Page.Loads (Sum)
1,326
14,336
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Day.Of.Week
1
2
3
4
5
6
7
+262
+263
+257
+243
+68
+81
+48


Returning.Visits by Day.Of.Week
Day.Of.Week
2
Returning.Visits (Sum)
1,200
1,000
800
600
400
200
0
1,609 3,512 3,976 4,298 4,638 4,903 5,203 5,675 6,078 6,670
2,838 3,766 4,096 4,432 4,770 5,000 5,463 5,841 6,372 7...
Page.Loads

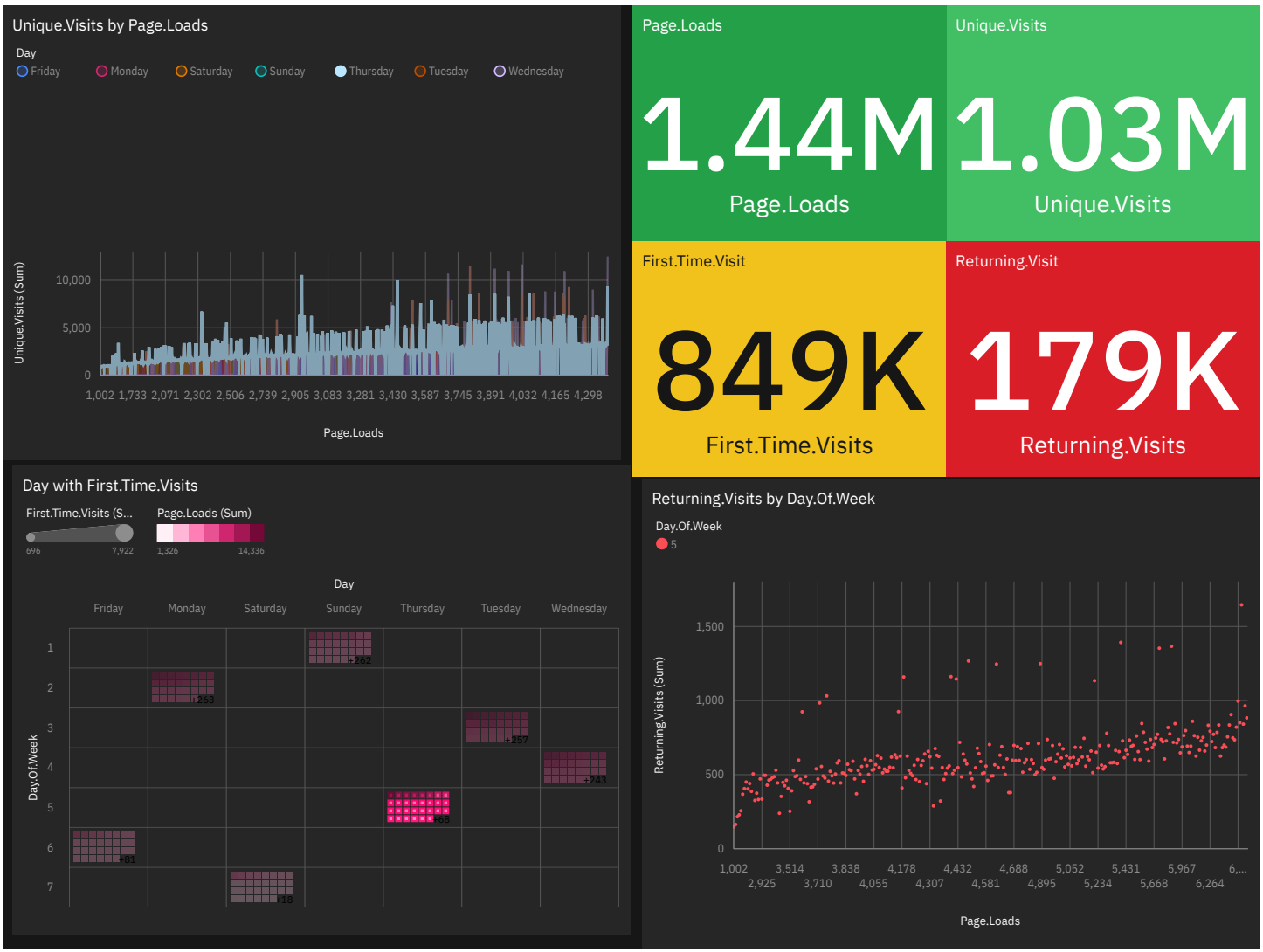
Tab 1


Unique.Visits by Page.Loads
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Unique.Visits (Sum)
10,000
5,000
0
1,002 1,733 2,071 2,302 2,506 2,739 2,905 3,083 3,281 3,430 3,587 3,745 3,891 4,032 4,165 4,298
Page.Loads
Page.Loads
1.54M
Page.Loads
Unique.Visits
1.1M
Unique.Visits
First.Time.Visit
908K
First.Time.Visits
Returning.Visit
189K
Returning.Visits
Day with First.Time.Visits
First.Time.Visits (S...
696
7,922
Page.Loads (Sum)
1,326
14,336
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Day.Of.Week
1
2
3
4
5
6
7
Returning.Visits by Day.Of.Week
Day.Of.Week
3
Returning.Visits (Sum)
1,400
1,200
1,000
800
600
400
200
0
1,644 3,740 4,046 4,421 4,728 4,943 5,395 5,759 6,191 6,...
3,077 3,898 4,223 4,563 4,821 5,160 5,572 5,909 6,467
Page.Loads

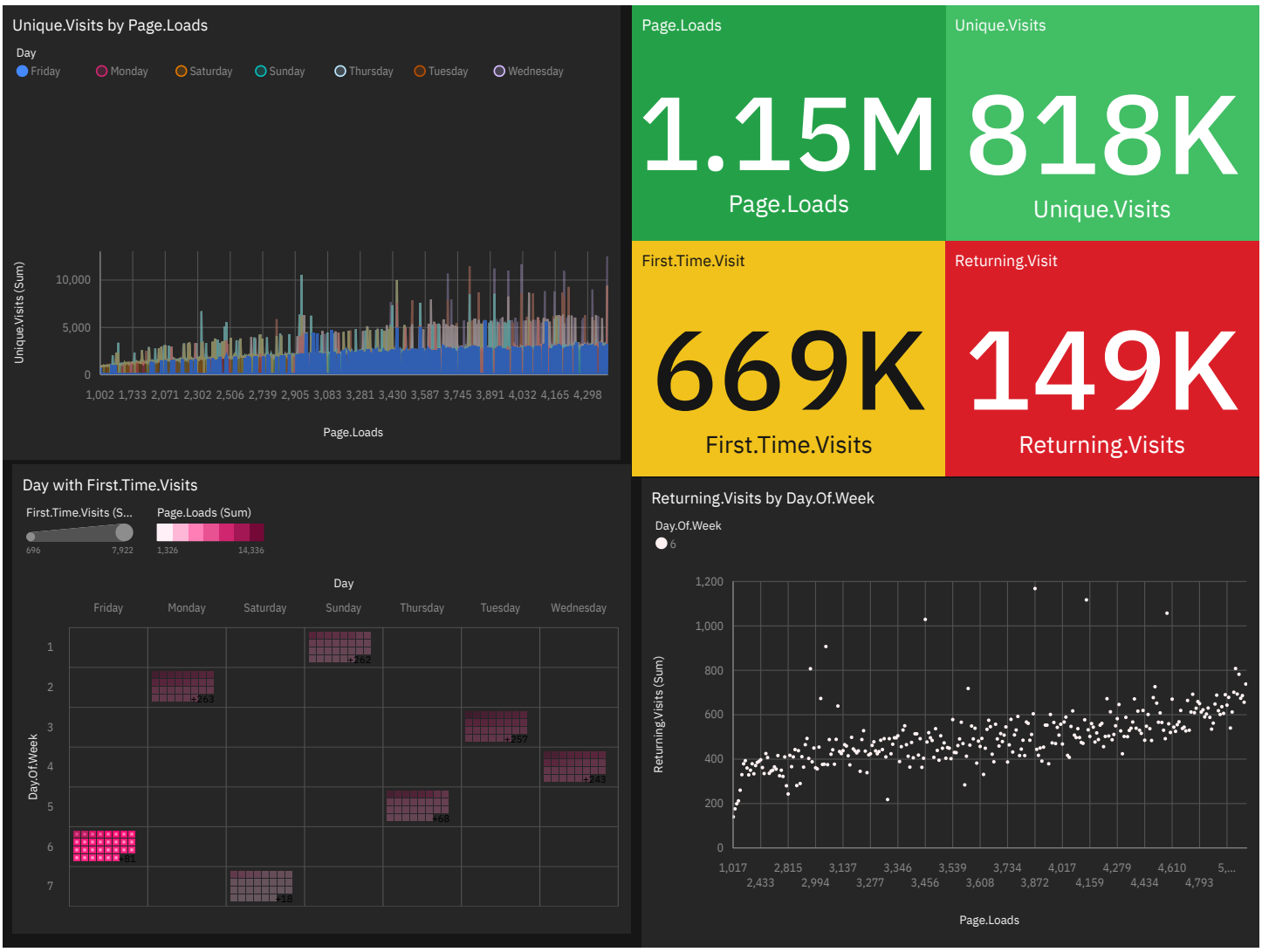
Tab 1


Unique.Visits by Page.Loads
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Unique.Visits (Sum)
10,000
5,000
0
1,002 1,733 2,071 2,302 2,506 2,739 2,905 3,083 3,281 3,430 3,587 3,745 3,891 4,032 4,165 4,298
Page.Loads
Page.Loads
1.52M
Page.Loads
Unique.Visits
1.09M
Unique.Visits
First.Time.Visit
898K
First.Time.Visits
Returning.Visit
188K
Returning.Visits
Day with First.Time.Visits
First.Time.Visits (S...
696
7,922
Page.Loads (Sum)
1,326
14,336
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Day.Of.Week
1
2
3
4
5
6
7
+262
+263
+257
+243
+68
+81
+48
Returning.Visits by Day.Of.Week
Day.Of.Week
4
Returning.Visits (Sum)
2,000
1,500
1,000
500
0
1,381 3,572 4,010 4,361 4,627 4,989 5,329 5,667 6,159 6,...
3,024 3,844 4,205 4,535 4,801 5,144 5,476 5,817 6,581
Page.Loads

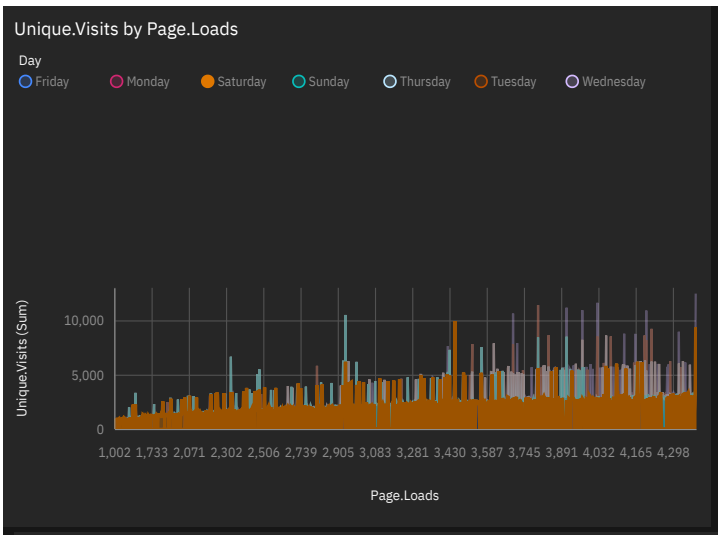
Tab 1

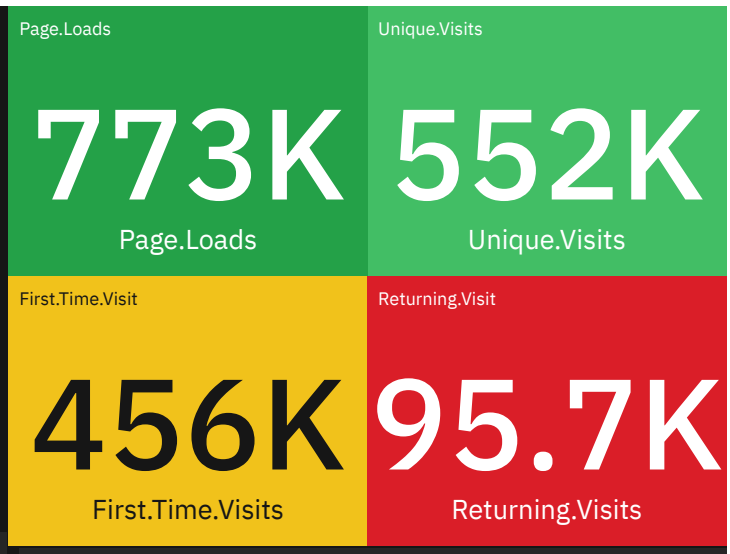

Unique.Visits by Page.Loads
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Unique.Visits (Sum)
10,000
5,000
0
1,002 1,733 2,071 2,302 2,506 2,739 2,905 3,083 3,281 3,430 3,587 3,745 3,891 4,032 4,165 4,298
Page.Loads
Page.Loads
1.44M
Page.Loads
Unique.Visits
1.03M
Unique.Visits
First.Time.Visit
849K
First.Time.Visits
Returning.Visit
179K
Returning.Visits
Day with First.Time.Visits
First.Time.Visits (S...
696
7,922
Page.Loads (Sum)
1,326
14,336
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Day.Of.Week
1
2
3
4
5
6
7
Returning.Visits by Day.Of.Week
Day.Of.Week
5
Returning.Visits (Sum)
1,500
1,000
500
0
1,002 2,925 3,514 3,710 3,838 4,055 4,178 4,307 4,432 4,581 4,688 4,895 5,052 5,234 5,431 5,668 5,967 6,264
Page.Loads

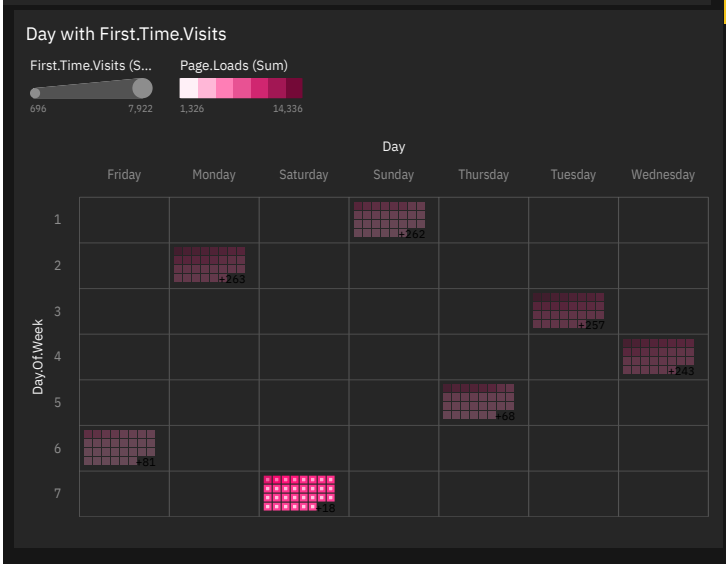
Tab 1


Unique.Visits by Page.Loads
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Unique.Visits (Sum)
10,000
5,000
0
1,002 1,733 2,071 2,302 2,506 2,739 2,905 3,083 3,281 3,430 3,587 3,745 3,891 4,032 4,165 4,298
Page.Loads
Page.Loads
1.15M
Page.Loads
Unique.Visits
818K
Unique.Visits
First.Time.Visit
669K
First.Time.Visits
Returning.Visit
149K
Returning.Visits
Day with First.Time.Visits
First.Time.Visits (S...
696
7,922
Page.Loads (Sum)
1,326
14,336
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Day.Of.Week
1
2
3
4
5
6
7
+262
+263
+257
+243
+68
+48
Returning.Visits by Day.Of.Week
Day.Of.Week
6
Returning.Visits (Sum)
1,200
1,000
800
600
400
200
0
1,017 2,815 3,137 3,346 3,539 3,734 4,017 4,279 4,610 5,...
2,433 2,994 3,277 3,456 3,608 3,872 4,159 4,434 4,793
Page.Loads

Tab 1


Unique.Visits by Page.Loads
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Unique.Visits (Sum)
10,000
5,000
0
1,002 1,733 2,071 2,302 2,506 2,739 2,905 3,083 3,281 3,430 3,587 3,745 3,891 4,032 4,165 4,298
Page.Loads


Page.Loads
773K
Page.Loads
Unique.Visits
552K
Unique.Visits
First.Time.Visit
456K
First.Time.Visits
Returning.Visit
95.7K
Returning.Visits


Day with First.Time.Visits
First.Time.Visits (S...
696
7,922
Page.Loads (Sum)
1,326
14,336
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Day.Of.Week
1
2
3
4
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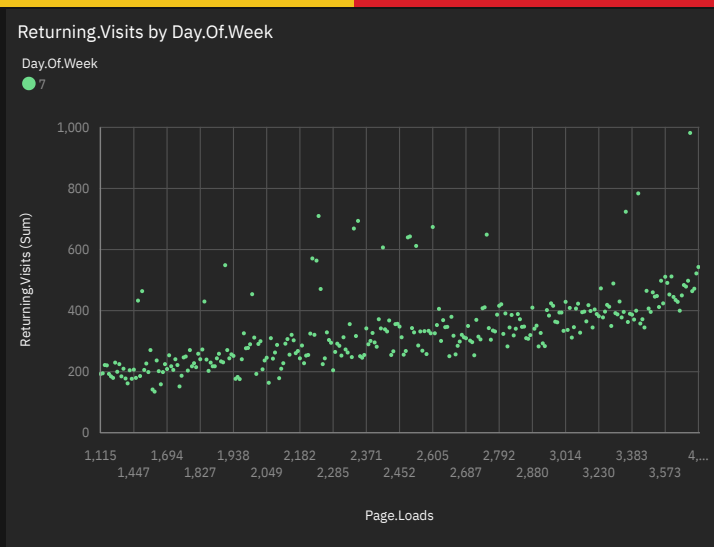
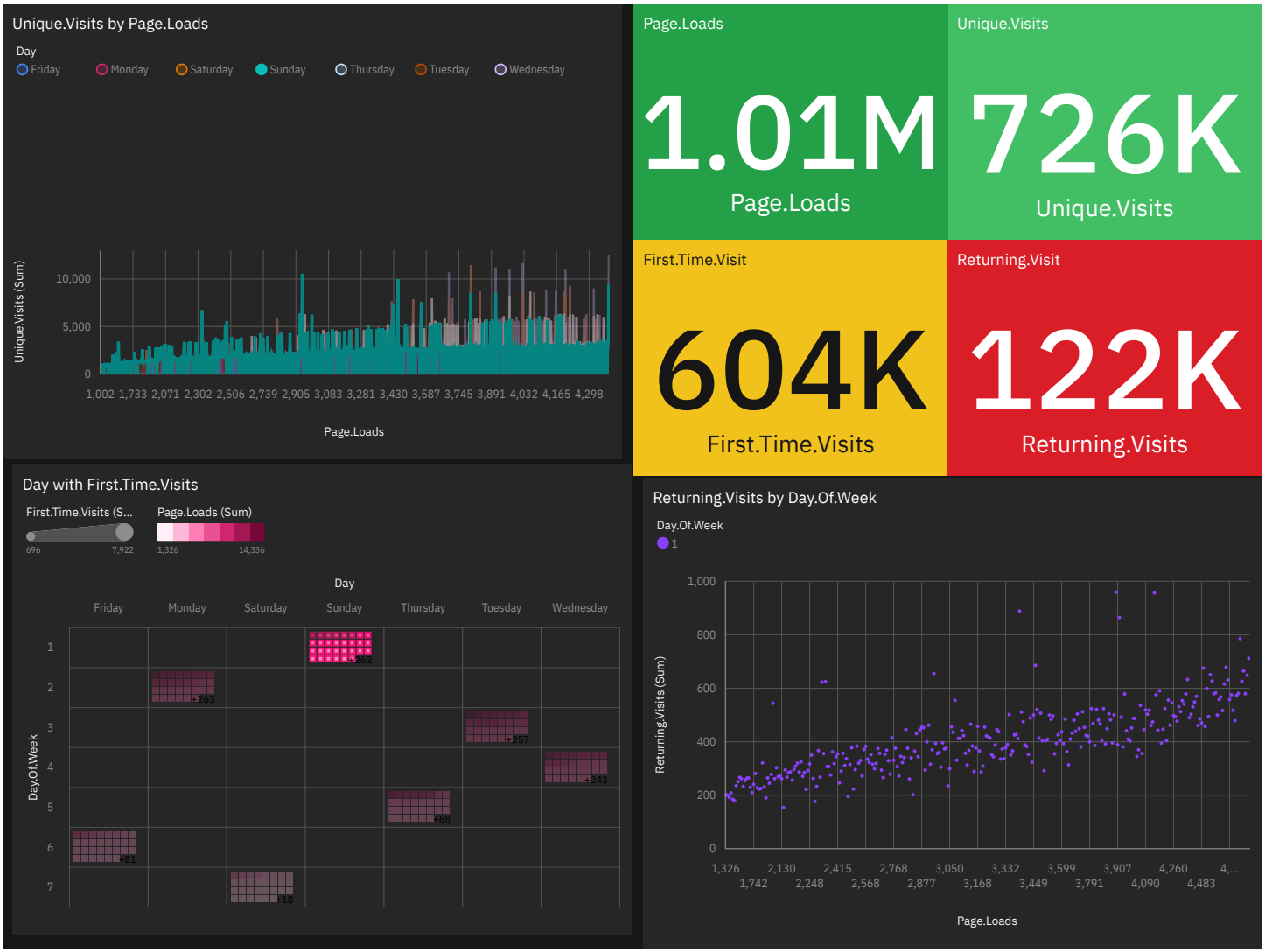
6
7
+262
+263
+257
+243
+68
+81


Returning.Visits by Day.Of.Week
Day.Of.Week
7
Returning.Visits (Sum)
1,000
800
600
400
200
0
1,115 1,694 1,938 2,182 2,371 2,605 2,792 3,014 3,383
1,447 1,827 2,049 2,285 2,452 2,687 2,880 3,230 3,573
Page.Loads

Tab 1


Unique.Visits by Page.Loads
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Unique.Visits (Sum)
10,000
5,000
0
1,002 1,733 2,071 2,302 2,506 2,739 2,905 3,083 3,281 3,430 3,587 3,745 3,891 4,032 4,165 4,298
Page.Loads
Page.Loads
1.01M
Page.Loads
Unique.Visits
726K
Unique.Visits
First.Time.Visit
604K
First.Time.Visits
Returning.Visit
122K
Returning.Visits
Day with First.Time.Visits
First.Time.Visits (S...
696
7,922
Page.Loads (Sum)
1,326
14,336
Day
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Day.Of.Week
1
2
3
4
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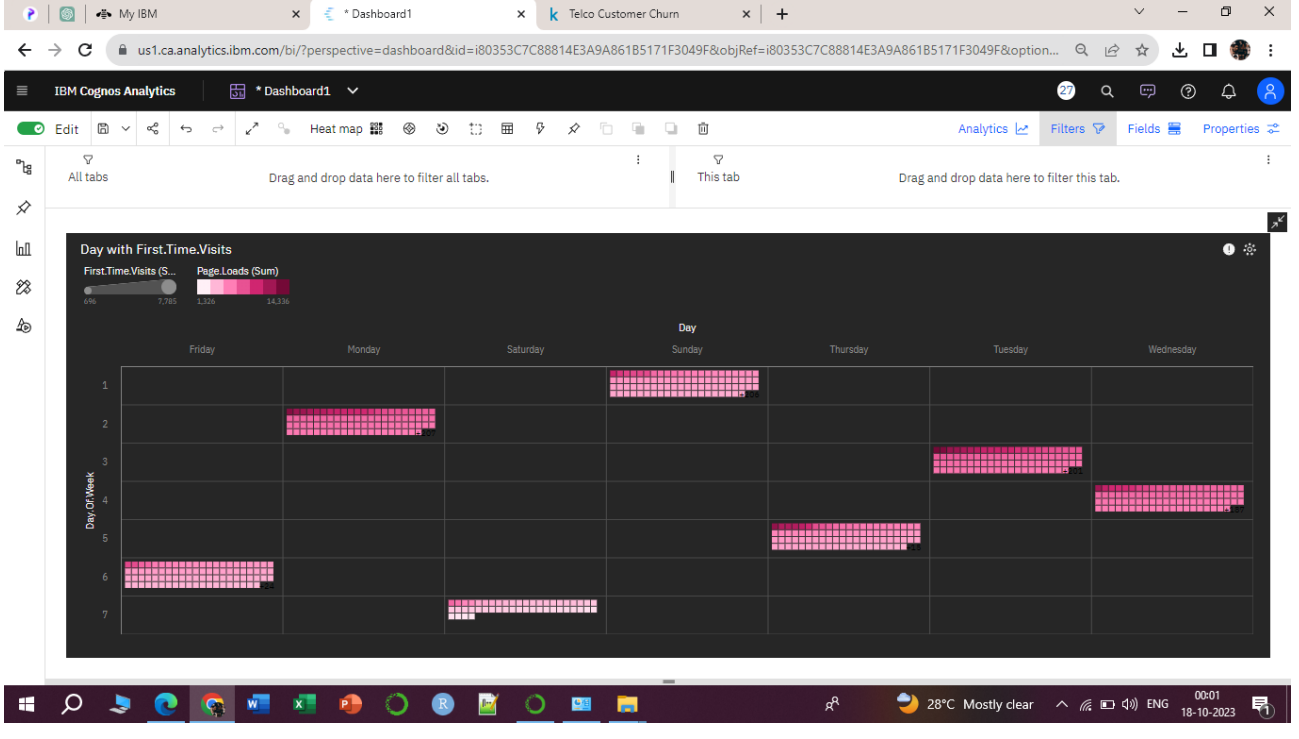
6
7
Returning.Visits by Day.Of.Week
Day.Of.Week
1
Returning.Visits (Sum)
1,000
800
600
400
200
0
1,326 2,130 2,415 2,768 3,050 3,332 3,599 3,907 4,260 4,...
1,742 2,248 2,568 2,877 3,168 3,449 3,791 4,090 4,483
Page.Loads

*Insights for above **“IBM Cognos Analytics”**

Unique Visits :

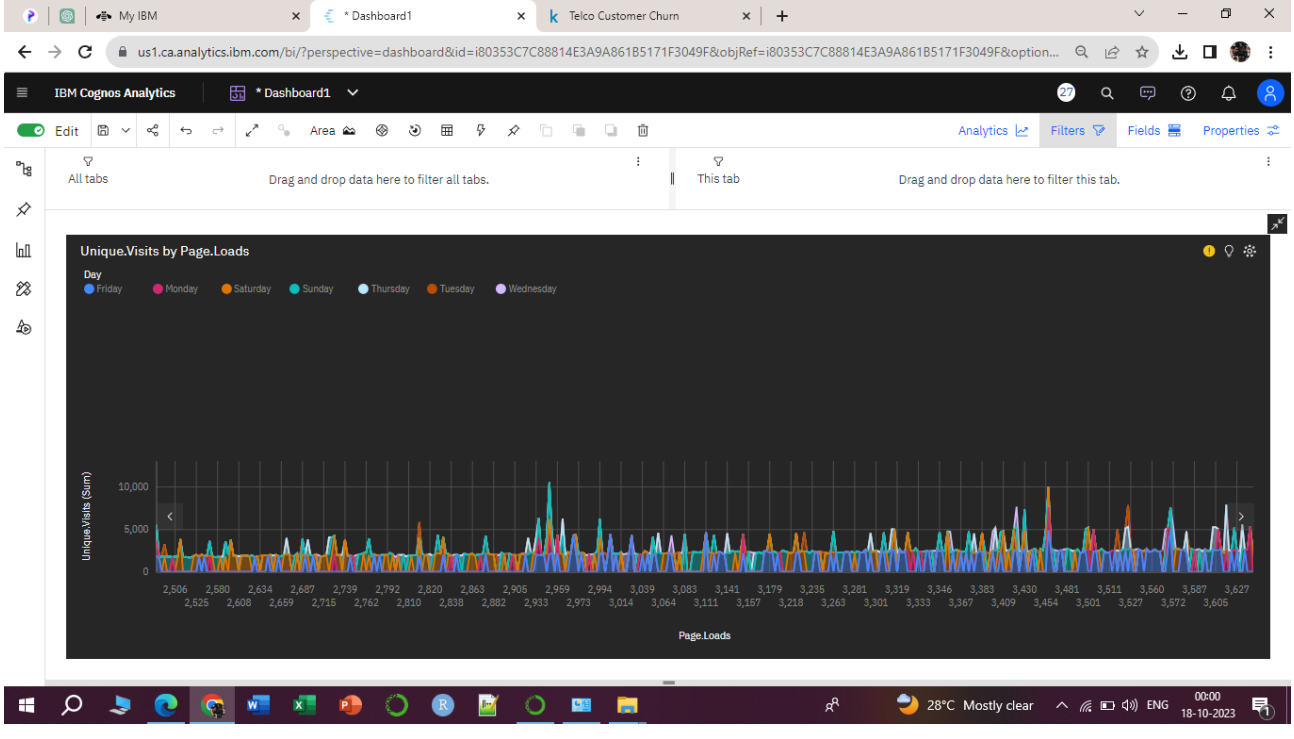
- Unique.Visits is unusually low when Day is Saturday.
- Based on the current forecasting, Unique.Visits may reach almost 481 thousand by Day Monday+1.
- It is projected that by Monday+1, 4205 will exceed 3973 in Unique.Visits by almost 1500.
- Page.Loads 4376 has the highest Total Returning.Visits but is ranked #5 in Total Unique.Visits.
- Page.Loads 4638 has the highest Total Unique.Visits but is ranked #3 in Total Returning.Visits.
- Over all values of Page.Loads and Day, the sum of Unique.Visits is almost 6.4 million.
- The summed values of Unique.Visits range from 667 to nearly 13 thousand.
- For Unique.Visits, the most significant values of Day are Tuesday, Wednesday, Monday, Thursday, and Friday, whose respective Unique.Visits values add up to over 5.1 million, or 80 % of the total.



First Time Visitors :

- Day.Of.Week 7 has the highest Unaggregated First.Time.Visits but is ranked #7 in Total Returning.Visits.
- Day Saturday has the highest Unaggregated First.Time.Visits but is ranked #7 in Total Returning.Visits.
- Day.Of.Week 3 has the highest Total Returning.Visits but is ranked #5 in Unaggregated First.Time.Visits.
- Day Tuesday has the highest Total Returning.Visits but is ranked #5 in Unaggregated First.Time.Visits.
- First.Time.Visits 3133 has the highest Total Returning.Visits but is ranked #2 in Total Page.Loads.
- First.Time.Visits 3146 has the highest Total Page.Loads but is ranked #2 in Total Returning.Visits.
- 1 (14.3 %), 2 (14.3 %), 3 (14.3 %), and 4 (14.3 %) are the most frequently occurring categories of Day.Of.Week with a combined count of 1240 items with First.Time.Visits values (57.2 % of the total).
- 1 (14.3 %), 2 (14.3 %), 3 (14.3 %), and 4 (14.3 %) are the most frequently occurring categories of Day.Of.Week with a combined count of 1240 items with Page.Loads values (57.2 % of the total).
- Across all values of Day.Of.Week, the sum of Page.Loads is over 8.9 million.
- The summed values of First.Time.Visits range from 0 to over 1500.
- The summed values of Page.Loads range from over a thousand to over fourteen thousand.
- For First.Time.Visits, the most significant values of Day.Of.Week are 3, 4, 2, 5, and 6, whose respective First.Time.Visits values add up to over 4.2 million, or 79.9 % of the total.s
- For Page.Loads, the most significant values of Day.Of.Week are 3, 4, 2, 5, and 6, whose respective Page.Loads values add up to over 7.1 million, or 80.1 % of the total.

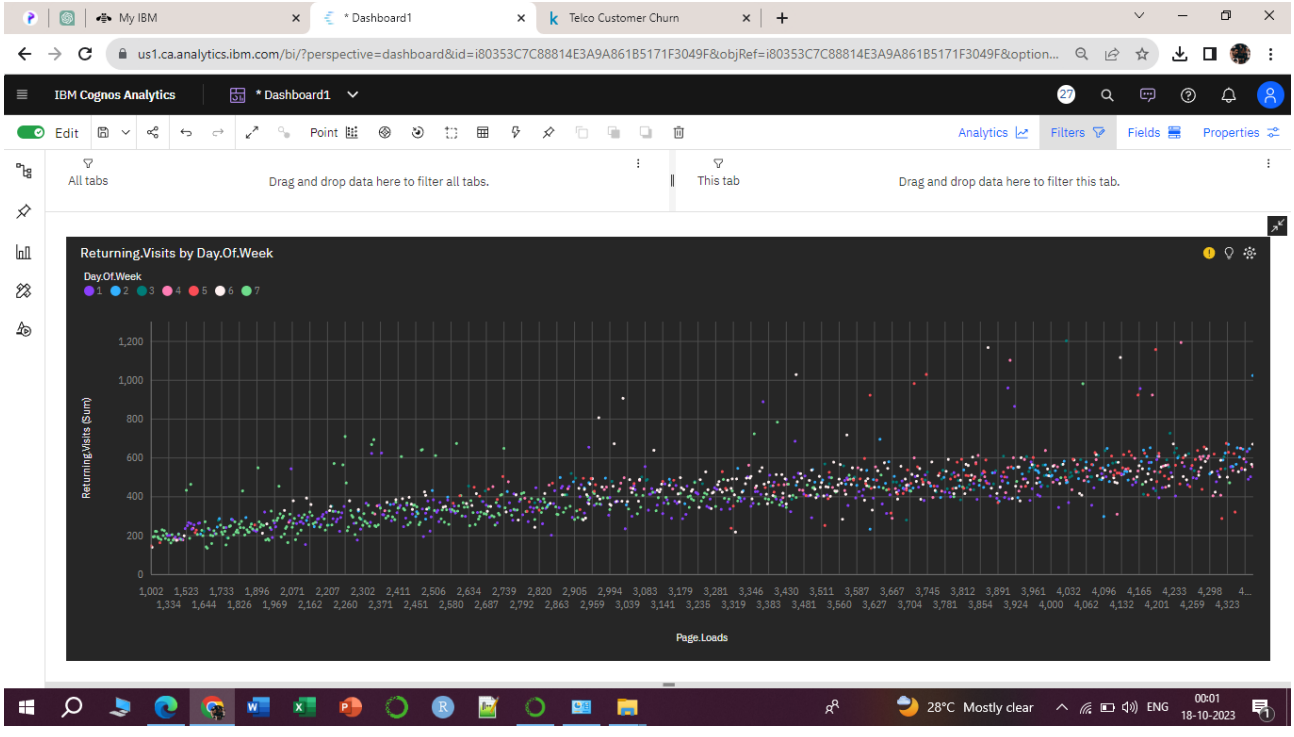
- For First.Time.Visits, the most significant values of Day are Tuesday, Wednesday, Monday, Thursday, and Friday, whose respective First.Time.Visits values add up to over 4.2 million, or 79.9 % of the total.
- For Page.Loads, the most significant values of Day are Tuesday, Wednesday, Monday, Thursday, and Friday, whose respective Page.Loads values add up to over 7.1 million, or 80.1 % of the total.



Returning Visit :

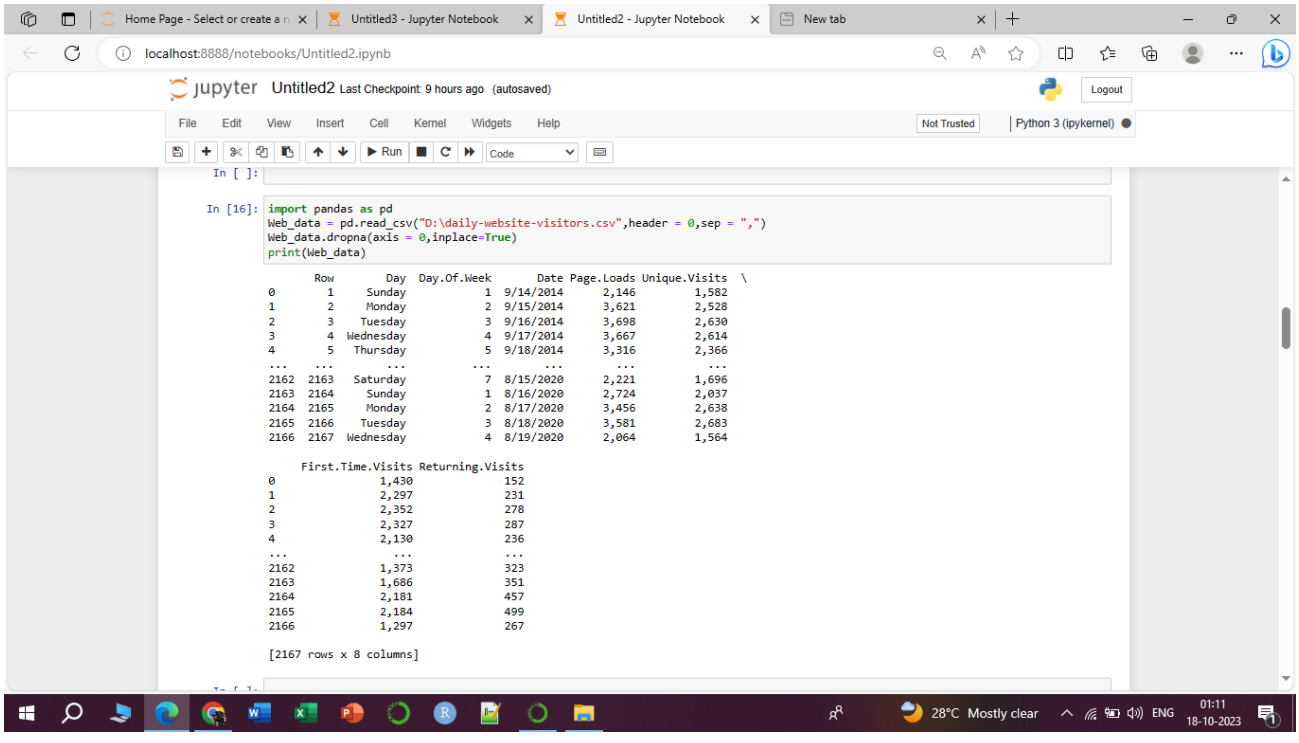
- Returning.Visits is unusually low when Day.Of.Week is 7.
- Based on the current forecasting, Returning.Visits may reach over 87 thousand by Day.Of.Week 9.
- It is projected that by 9, 4205 will exceed 3973 in Returning.Visits by 227.
- Across all values of Page.Loads and Day.Of.Week, the sum of Returning.Visits is over 1.1 million.
- The summed values of Returning.Visits range from 133 to over two thousand.

- For Returning.Visits, the most significant values of Day.Of.Week are 3, 4, 2, 5, and 6, whose respective



*‘Python Integration’ for Website Traffic Analysis

Extraction the Data file from the directory to the python text editor to excecute the data set .



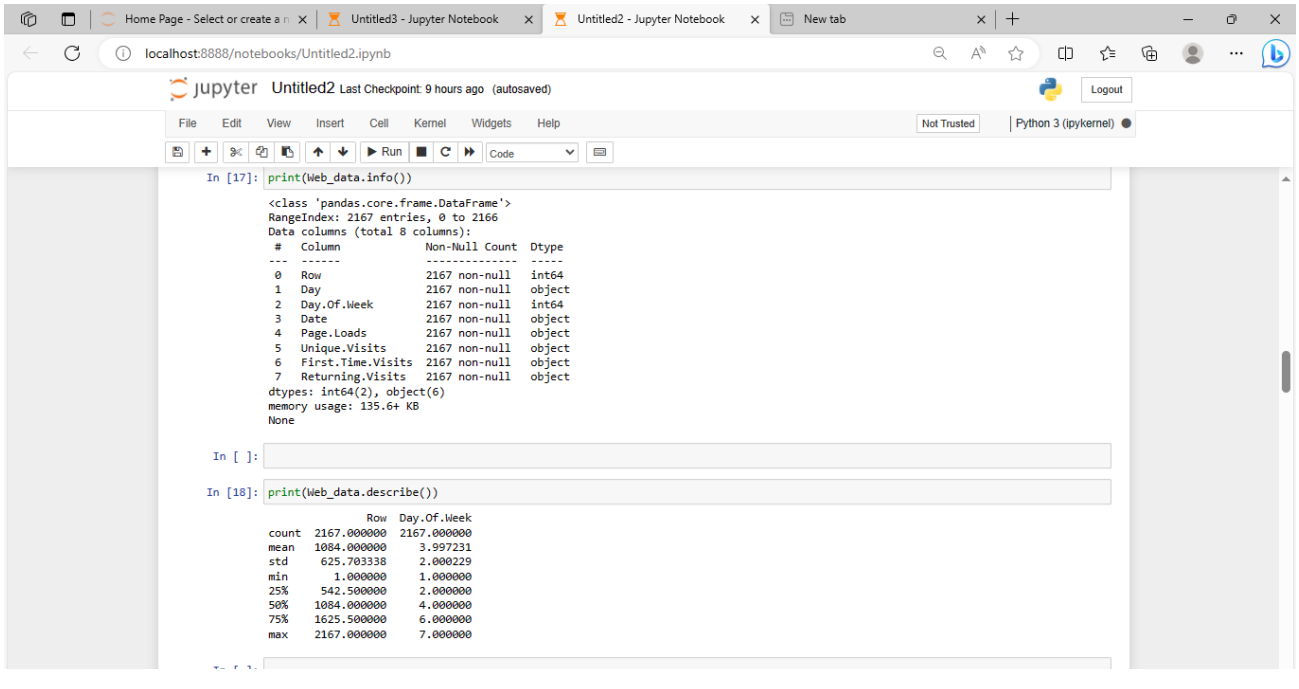
```
In [16]: import pandas as pd
         Web_data = pd.read_csv("D:\daily-website-visitors.csv",header = 0,sep = ",")
         Web_data.dropna(axis = 0,inplace=True)
         print(Web_data)
```

```
       Row        Day  Day.Of.Week       Date Page.Loads Unique.Visits  \
0        1     Sunday            1  9/14/2014      2,146        1,582
1        2     Monday            2  9/15/2014      3,621        2,528
2        3    Tuesday            3  9/16/2014      3,698        2,630
3        4  Wednesday            4  9/17/2014      3,667        2,614
4        5   Thursday            5  9/18/2014      3,316        2,366
...    ...        ...          ...        ...        ...          ...
2162  2163   Saturday            7  8/15/2020      2,221        1,696
2163  2164     Sunday            1  8/16/2020      2,724        2,037
2164  2165     Monday            2  8/17/2020      3,456        2,638
2165  2166    Tuesday            3  8/18/2020      3,581        2,683
2166  2167  Wednesday            4  8/19/2020      2,064        1,564

     First.Time.Visits Returning.Visits
0                1,430              152
1                2,297              231
2                2,352              278
3                2,327              287
4                2,130              236
...                ...              ...
2162             1,373              323
2163             1,686              351
2164             2,181              457
2165             2,184              499
2166             1,297              267

[2167 rows x 8 columns]
```

Getting of data set information using info function.



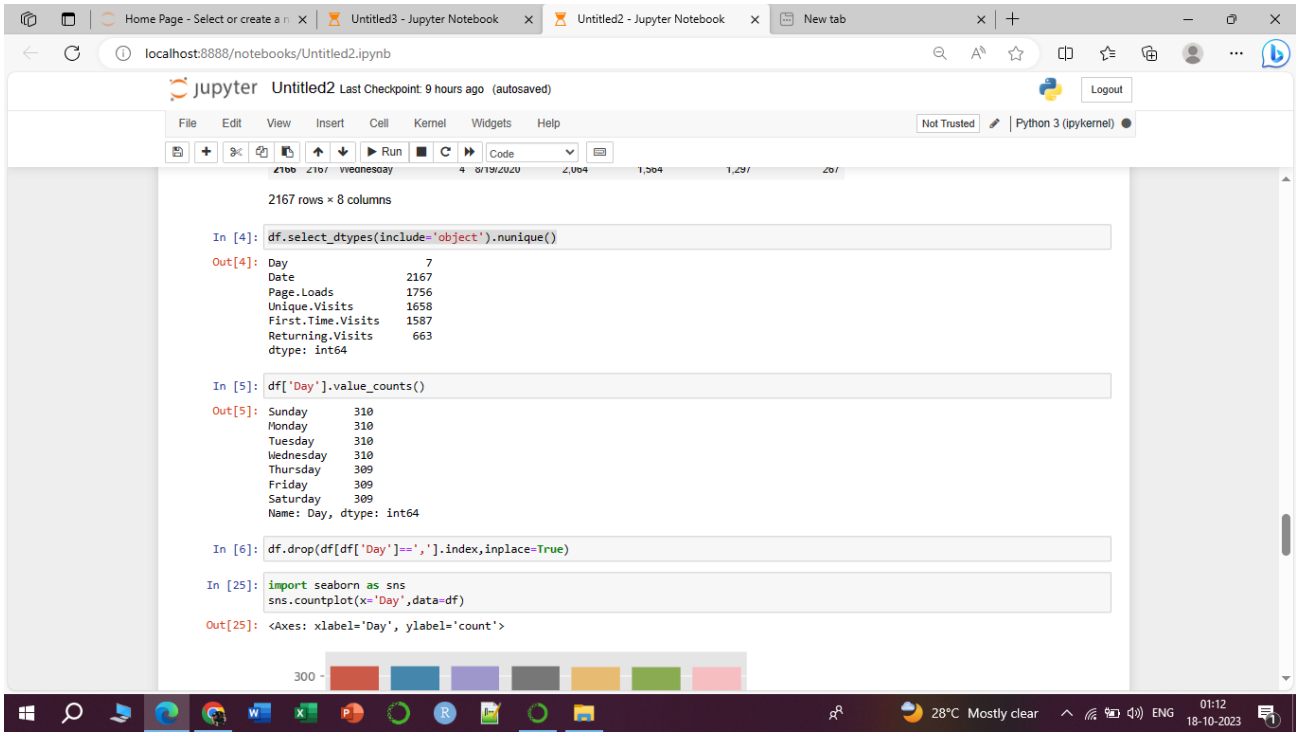
```
In [17]: print(Web_data.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2167 entries, 0 to 2166
Data columns (total 8 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   Row               2167 non-null   int64
 1   Day               2167 non-null   object
 2   Day.Of.Week       2167 non-null   int64
 3   Date              2167 non-null   object
 4   Page.Loads        2167 non-null   object
 5   Unique.Visits     2167 non-null   object
 6   First.Time.Visits 2167 non-null   object
 7   Returning.Visits  2167 non-null   object
dtypes: int64(2), object(6)
memory usage: 135.6+ KB
None
```

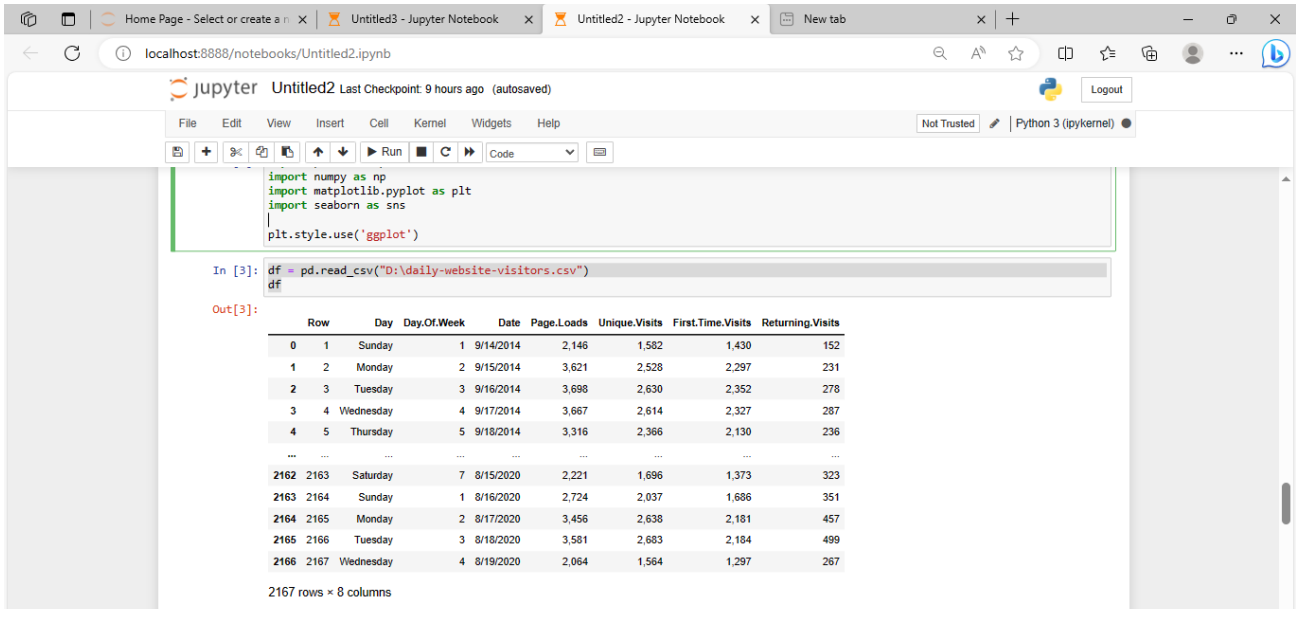
```
In [18]: print(Web_data.describe())
```

```
                Row  Day.Of.Week
count  2167.000000  2167.000000
mean   1084.000000     3.997231
std     625.703338     2.000229
min       1.000000     1.000000
25%     542.500000     2.000000
50%    1084.000000     4.000000
75%    1625.500000     6.000000
max    2167.000000     7.000000
```

Value Counts of each Insights of the data set

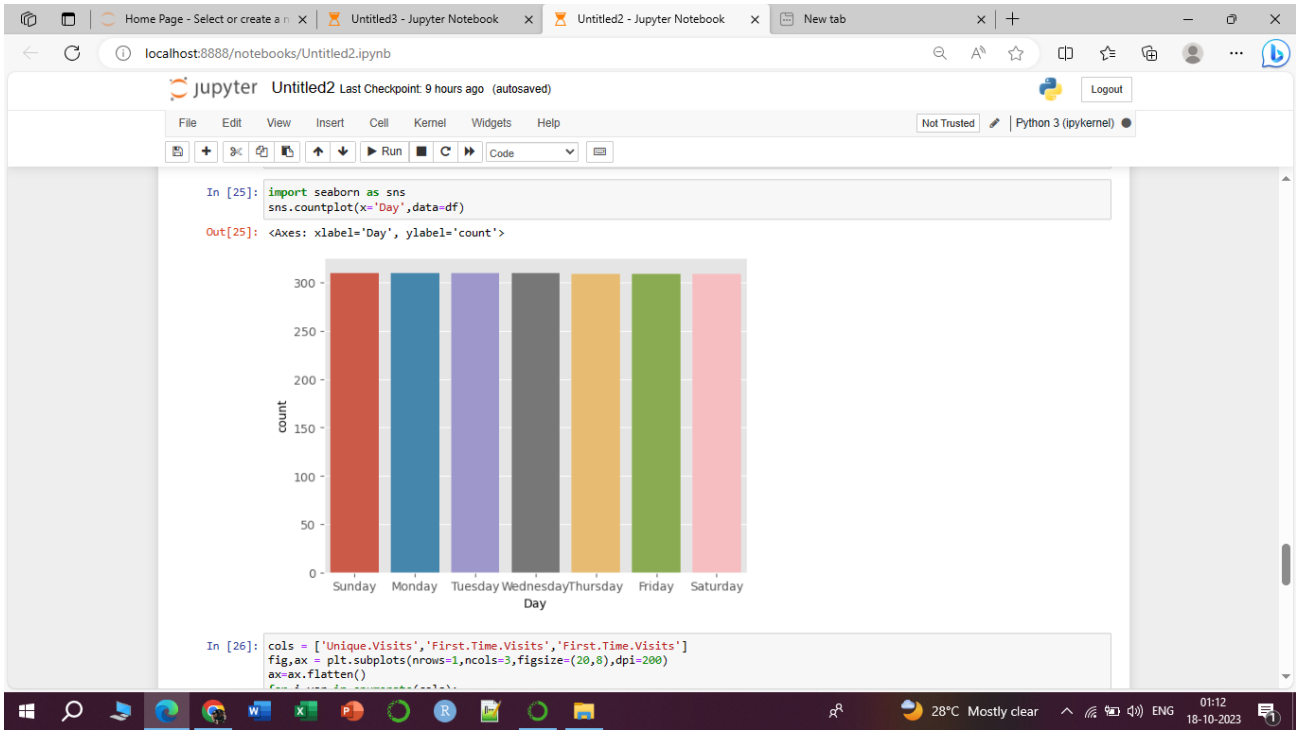


Again pointing out the data set with the help of Pandas Library.

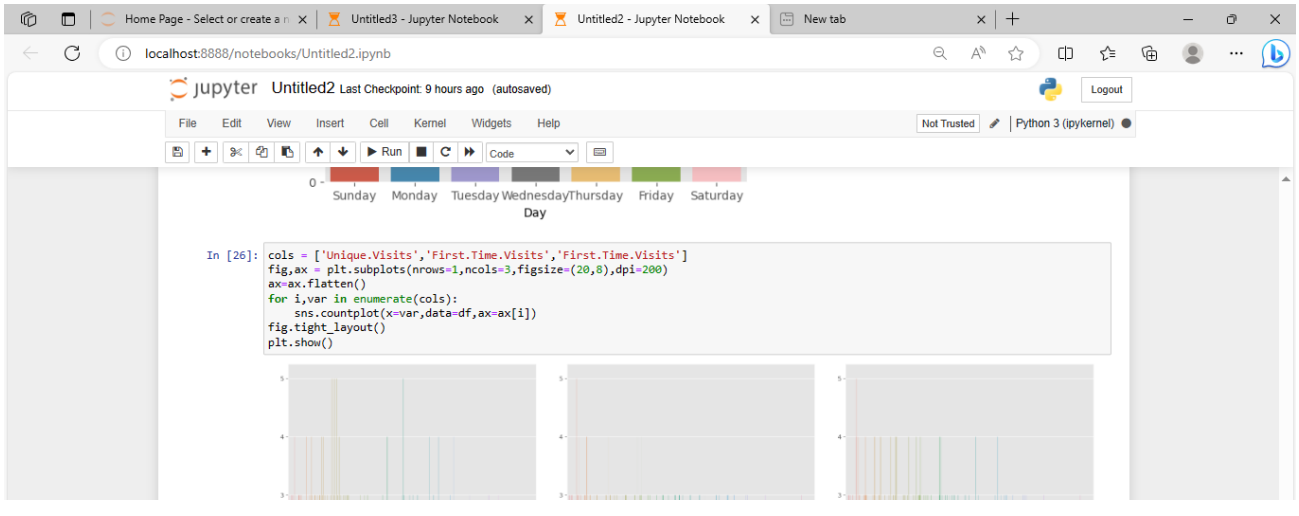


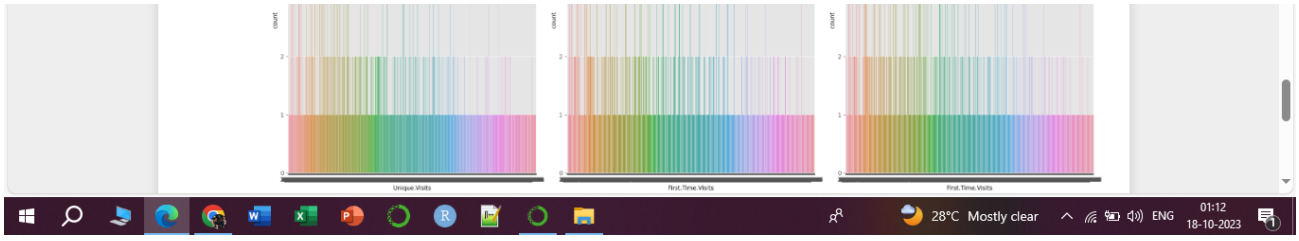
```
In [4]: df.select_dtypes(include='object').nunique()
Out[4]: Day          7
        Date      2167
        Page.Loads 1756
```

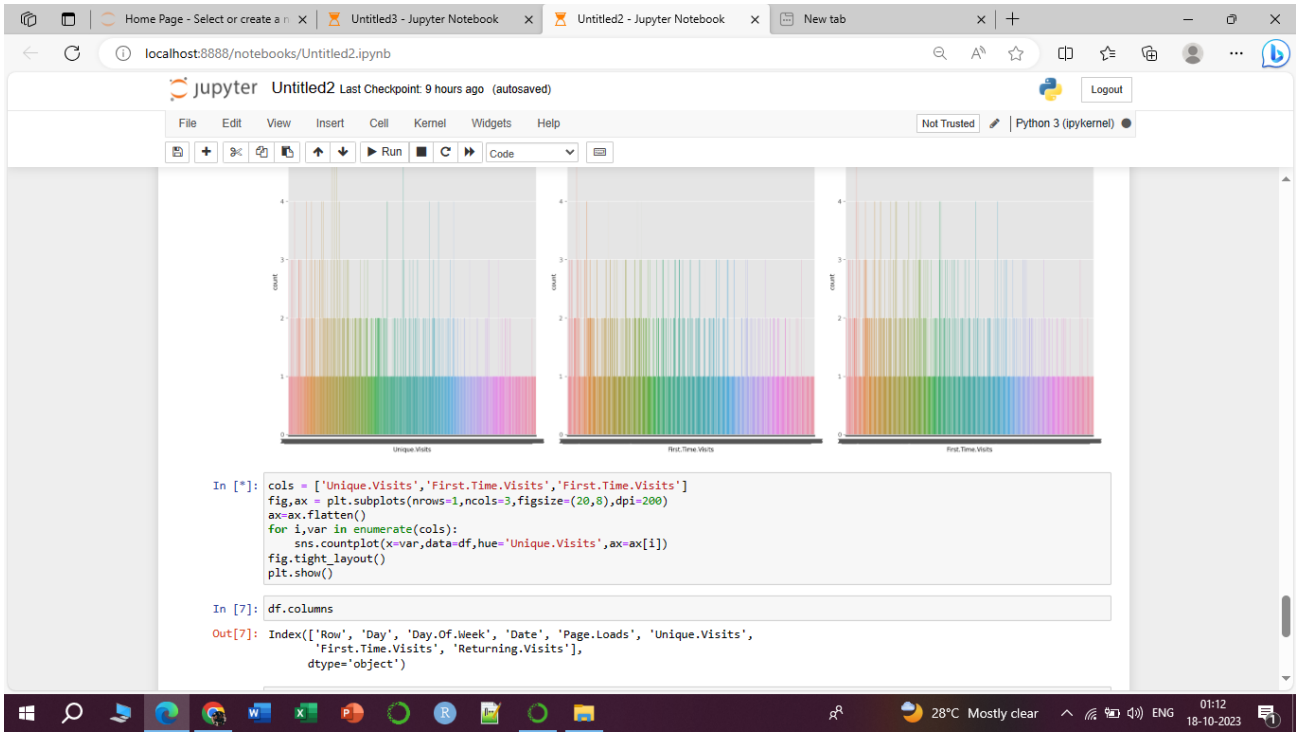
Listing the Number of Days that had been observed by the data set using Seaborn Library.



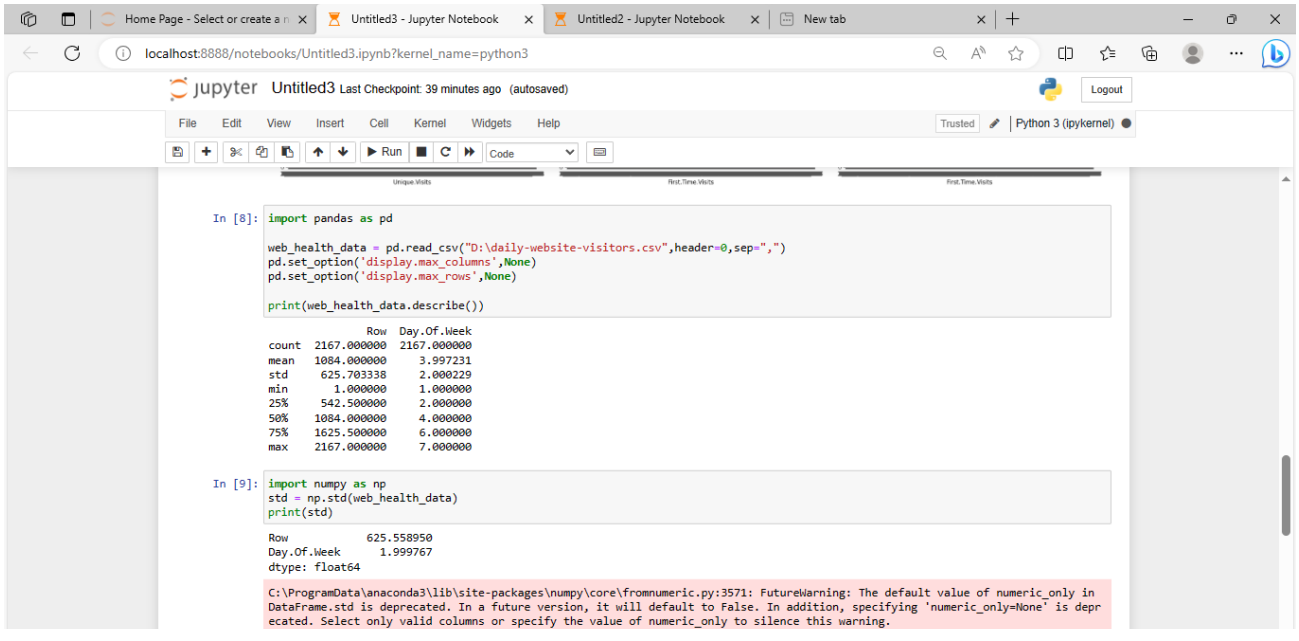
Plotting of Three important Stuffs like Unique visitor,First Time Visitor,Returning Visitor.

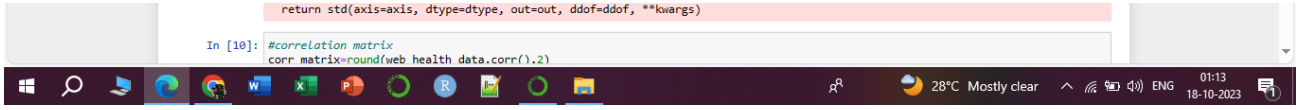


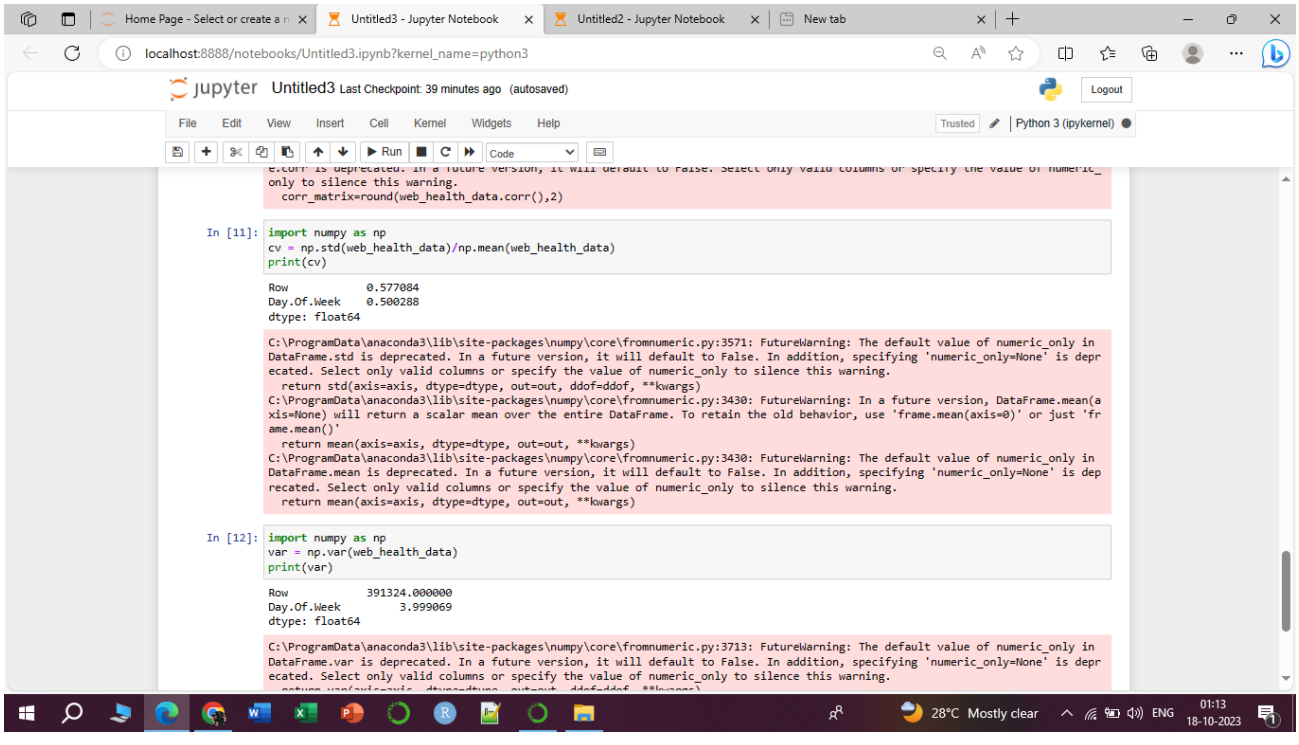




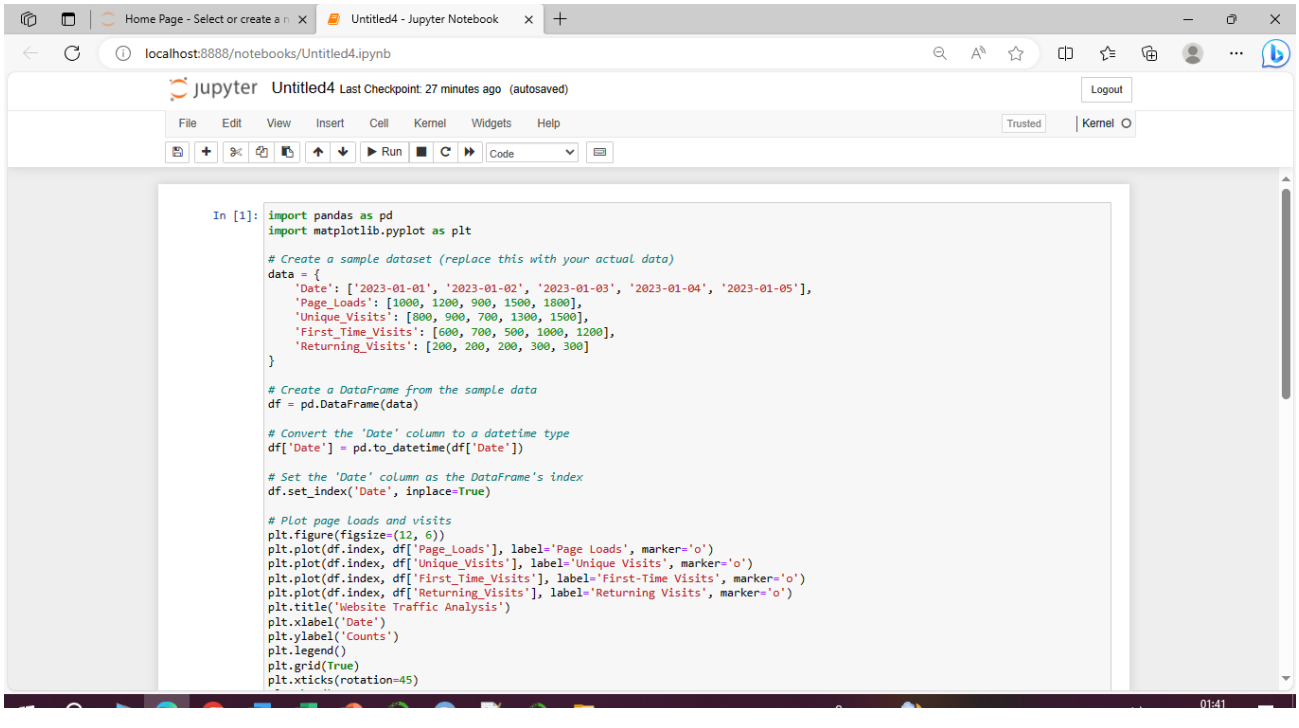
Mathematical Calculations of the data set with the help of Numpy Library.

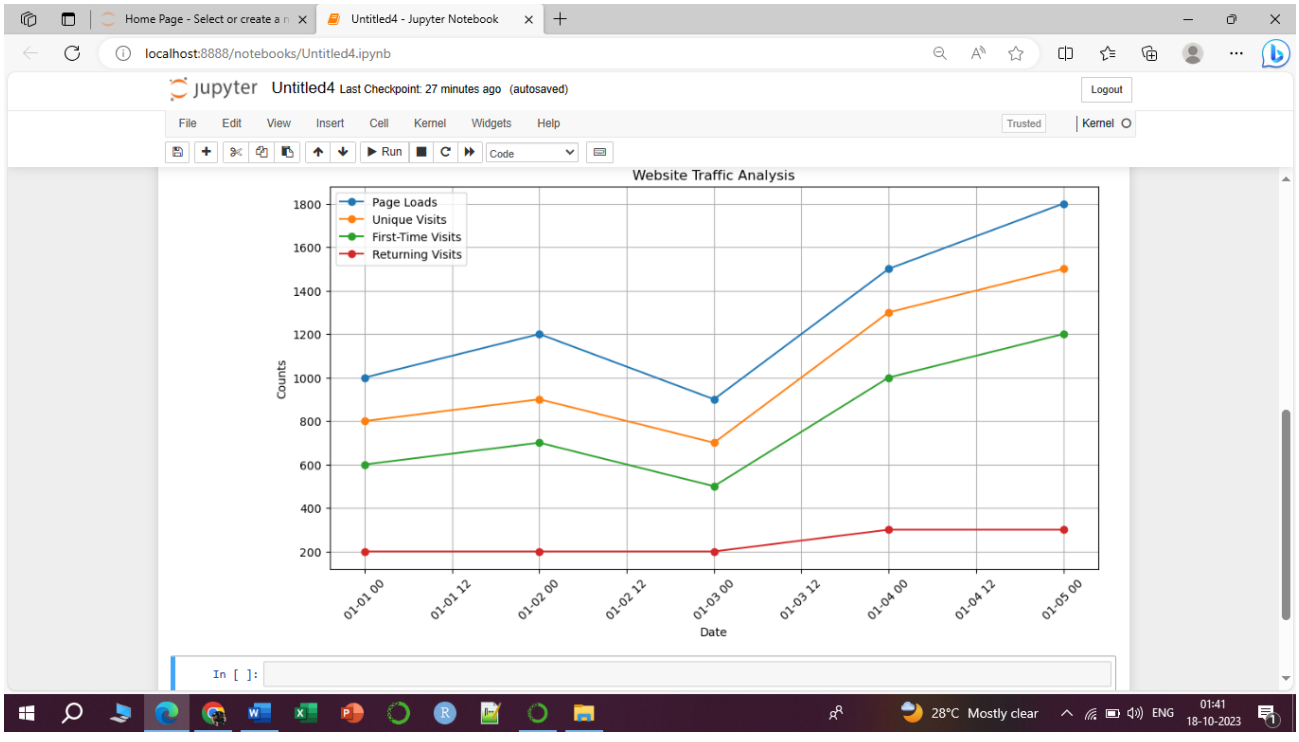






An Basic Observation with the Limited Data points and to ploltting in the Line Graph.





Conclusion :

In this Phase 3 : Development Part 1 Using IBM Cognos and Python Integration made the Basic Developing of the “Website Traffic Analysis” for Data Analytics with help of provided Kaggle Dataset.