# *Public transportation efficiency analysis*

IBM COGNOS VISUALIZATION:

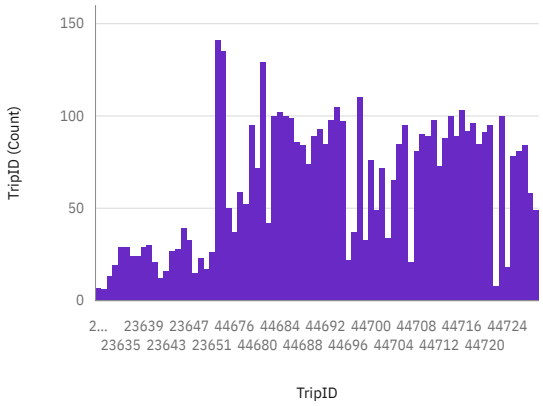
Design dashboards and reports in IBM Cognos to visualize. Continue building the analysis by creating visualizations using IBM Cognos and integrating code for data analysis.


*TEAMMATES:*

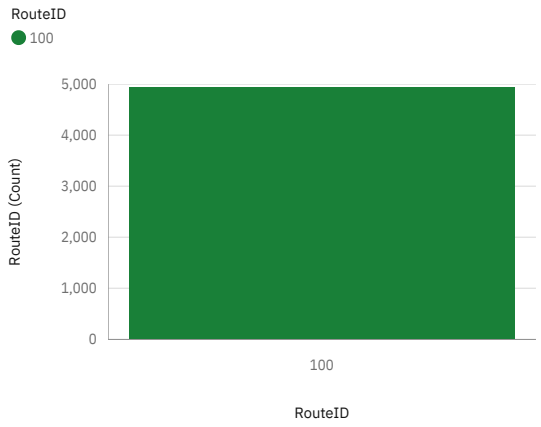
*J.ABISHEK PAUL (952421104004)*
*E.S JEBIN (952421104026)*
*C.DEEPAKKUMAR(952421104017)*
*S.K.STANLY (952421104053)*

Tab 1

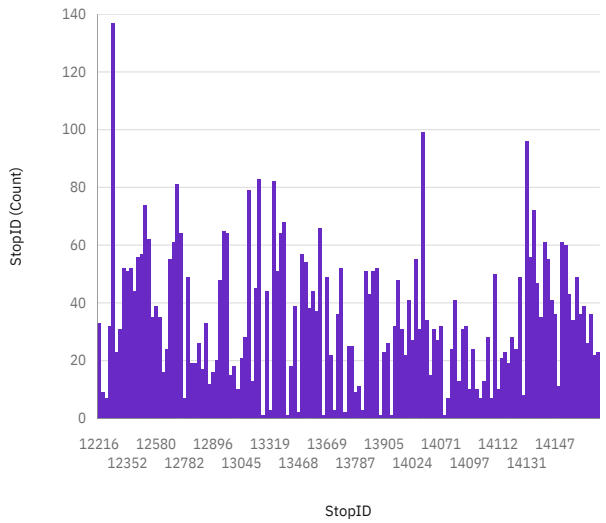
TripID by TripID



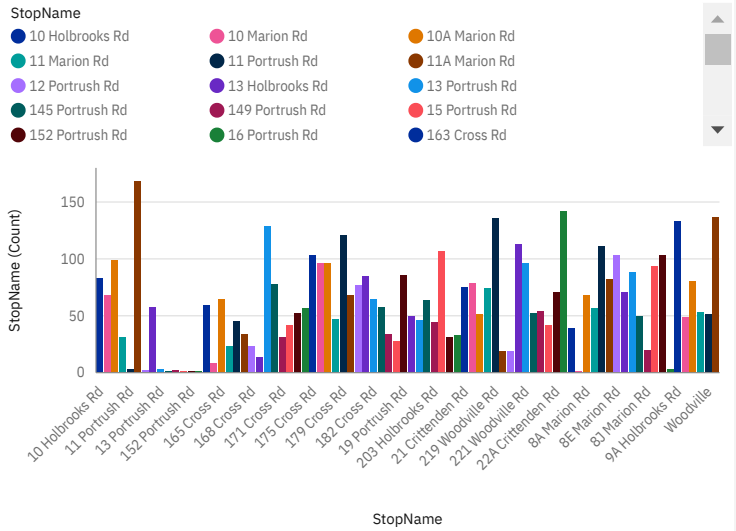

RouteID by RouteID colored by RouteID

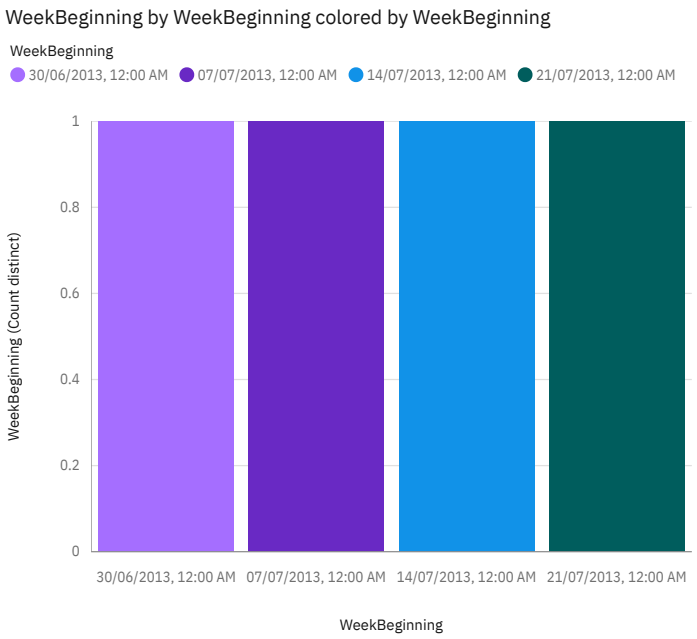


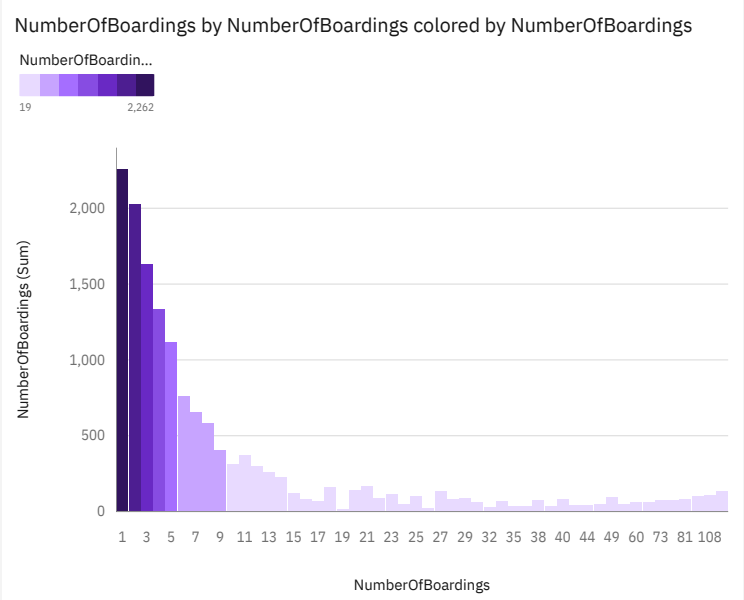
StopID by StopID




StopName by StopName colored by StopName




WeekBeginning by WeekBeginning colored by WeekBeginning
WeekBeginning
30/06/2013, 12:00 AM
07/07/2013, 12:00 AM
14/07/2013, 12:00 AM
21/07/2013, 12:00 AM
WeekBeginning (Count distinct)
1
0.8
0.6
0.4
0.2
0
30/06/2013, 12:00 AM
07/07/2013, 12:00 AM
14/07/2013, 12:00 AM
21/07/2013, 12:00 AM
WeekBeginning


NumberOfBoardings by NumberOfBoardings colored by NumberOfBoardings
NumberOfBoardin...
19
2,262
NumberOfBoardings (Sum)
2,000
1,500
1,000
500
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 32 35 38 40 44 49 60 73 81 108
NumberOfBoardings

where we will delve deeper into the analysis, modeling, and recommendations to enhance public transportation efficiency. A well-structured dataset can significantly impact the project's overall success.

# CODE SNIPPETS:

```
+ Code + Text
```

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

```
[3] df = pd.read_csv("/content/20140711.CSV")
    df.head()
```

| | TripID | RouteID | StopID | StopName | WeekBeginning | NumberOfBoardings |
|---|---|---|---|---|---|---|
| 0 | 23631 | 100 | 14156.0 | 181 Cross Rd | 2013-06-30 00:00:00 | 1.0 |
| 1 | 23631 | 100 | 14144.0 | 177 Cross Rd | 2013-06-30 00:00:00 | 1.0 |
| 2 | 23632 | 100 | 14132.0 | 175 Cross Rd | 2013-06-30 00:00:00 | 1.0 |
| 3 | 23633 | 100 | 12266.0 | Zone A Arndale Interchange | 2013-06-30 00:00:00 | 2.0 |
| 4 | 23633 | 100 | 14147.0 | 178 Cross Rd | 2013-06-30 00:00:00 | 1.0 |

```
[4] df.shape
```

```
(95802, 6)
```

```
+ Code + Text
```

```
df.info()
```

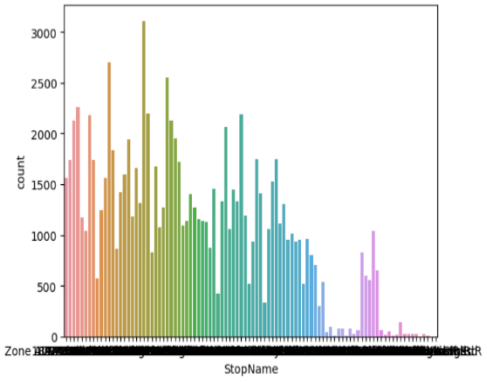
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 95802 entries, 0 to 95801
Data columns (total 6 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   TripID             95802 non-null  int64
 1   RouteID            95801 non-null  object
 2   StopID             95801 non-null  float64
 3   StopName           95801 non-null  object
 4   WeekBeginning      95801 non-null  object
 5   NumberOfBoardings  95801 non-null  float64
dtypes: float64(2), int64(1), object(3)
memory usage: 4.4+ MB
```

```
[6] df.describe()
```

| | TripID | StopID | NumberOfBoardings |
|---|---|---|---|
| count | 95802.000000 | 95801.000000 | 95801.000000 |
| mean | 26069.676186 | 13503.516644 | 3.818467 |
| std | 18789.899838 | 778.669602 | 7.368533 |
| min | 5605.000000 | 12213.000000 | 1.000000 |
| 25% | 5647.000000 | 12858.000000 | 1.000000 |
| 50% | 25365.500000 | 13669.000000 | 2.000000 |
| 75% | 44701.000000 | 14104.000000 | 4.000000 |
| max | 44741.000000 | 18072.000000 | 193.000000 |

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

```
<Axes: xlabel='StopName', ylabel='count'>
```



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

```
TripID              0
RouteID             1
StopID              1
StopName            1
WeekBeginning       1
NumberOfBoardings   1
dtype: int64
```

```
[12] for feature in df.columns:
         if df[feature].isnull().sum()>0:
             print(f"{feature} : {round(df[feature].isnull().mean(),4)*100}%")
```

```
RouteID : 0.0%
StopID : 0.0%
StopName : 0.0%
WeekBeginning : 0.0%
NumberOfBoardings : 0.0%
```

```
[14] ## find dublicate rows in dataset
     duplicate = df[df.duplicated()]
     duplicate
```

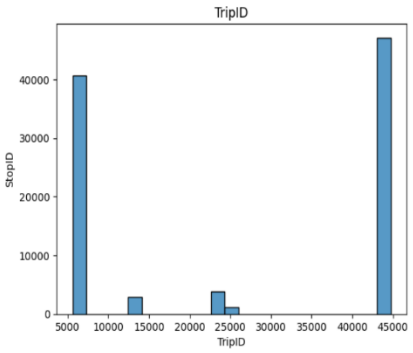
| TripID | RouteID | StopID | StopName | WeekBeginning | NumberOfBoardings |
|---|---|---|---|---|---|

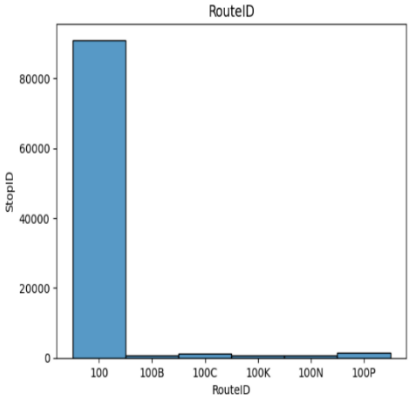
```
for i in df.columns:
    print(f" {i}  :  {len(df[i].unique())}")
```

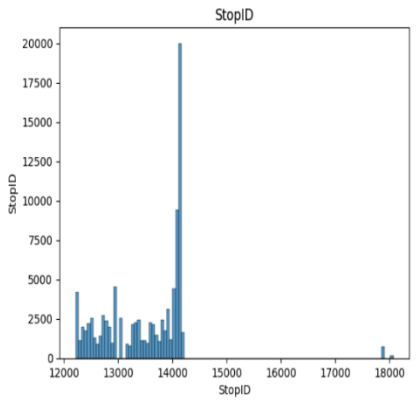
```
 TripID  :  182
 RouteID  :  7
 StopID  :  166
 StopName  :  97
 WeekBeginning  :  55
 NumberOfBoardings  :  145
```

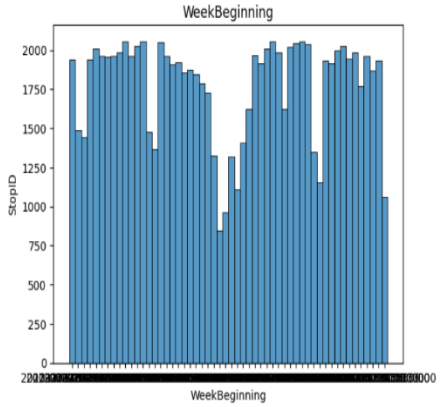
+ Code + Text

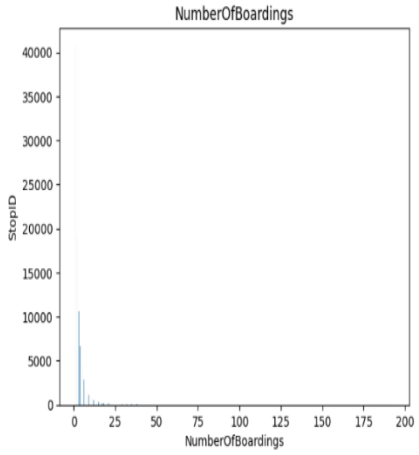
```
for feature in df.columns:
    if feature == "StopName":
        pass
    else:
        bar = sns.histplot(df[feature] , kde_kws = {'bw' : 1} , )
        plt.xlabel(feature)
        plt.ylabel("StopID")
        plt.title(feature)
        plt.show()
```






```
# removing outliers
Q1 = df.quantile(0.25)
Q3 = df.quantile(0.75)
IQR = Q3 - Q1
print(IQR)
```

```
TripID               39054.0
StopID                1246.0
NumberOfBoardings        3.0
dtype: float64
<ipython-input-24-6d553dabc4cf>:2: FutureWarning: The default value of numeric_only in DataFrame.quantile is deprecated. In a future version, it will default to False. S
  Q1 = df.quantile(0.25)
<ipython-input-24-6d553dabc4cf>:3: FutureWarning: The default value of numeric_only in DataFrame.quantile is deprecated. In a future version, it will default to False. S
  Q3 = df.quantile(0.75)
```

```
[25] df = df[~((df < (Q1 - 1.5 * IQR)) |(df > (Q3 + 1.5 * IQR))).any(axis=1)]
     df.shape
```

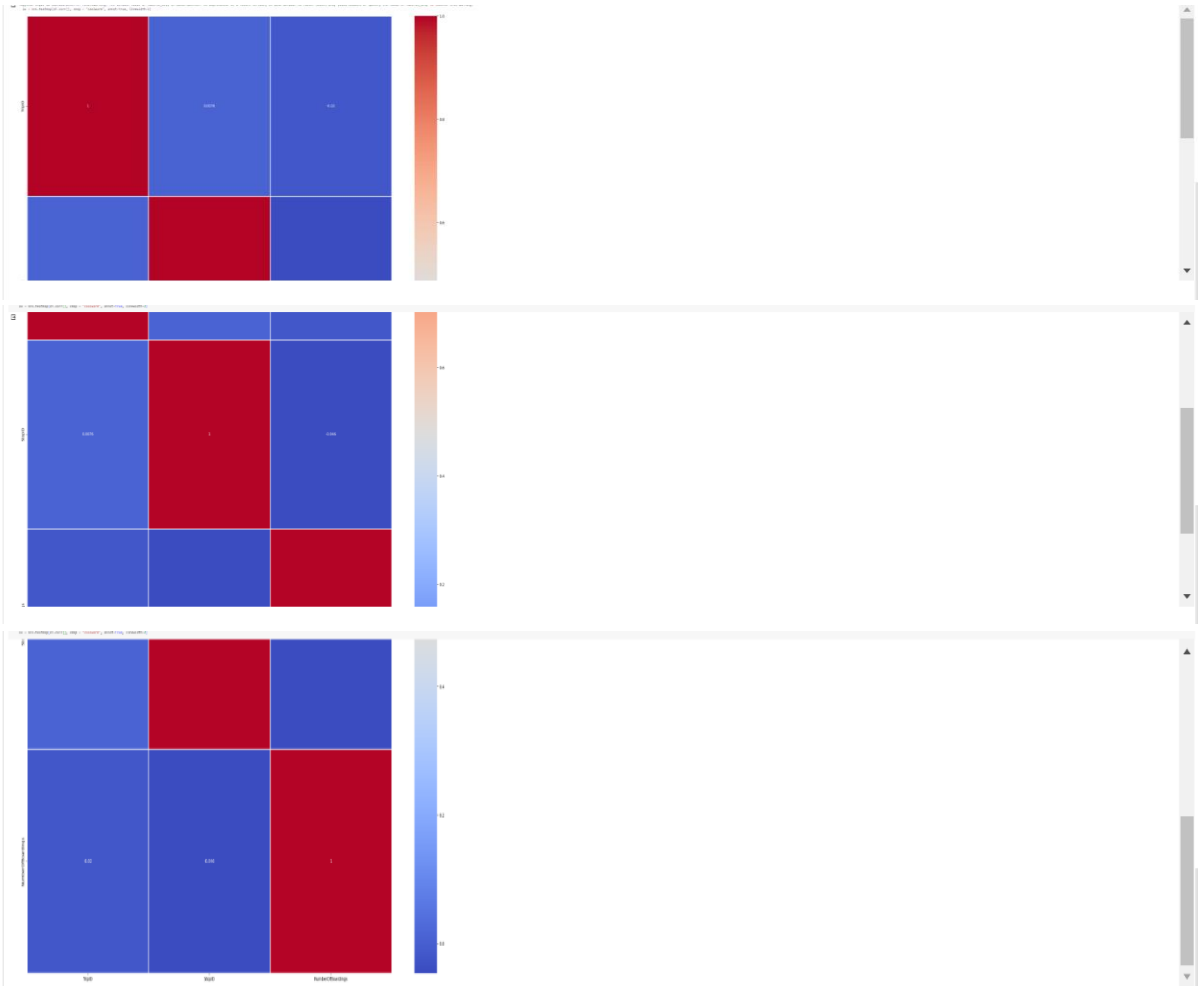
```
<ipython-input-25-f4e1682787c4>:1: FutureWarning: Automatic reindexing on DataFrame vs Series comparisons is deprecated and will raise ValueError in a future version. Do
  df = df[~((df < (Q1 - 1.5 * IQR)) |(df > (Q3 + 1.5 * IQR))).any(axis=1)]
(87201, 6)
```

```
[27] df["StopName"].value_counts()
```

```
11A  Marion Rd               2527
23  Findon Rd                2319
219 Woodville Rd             2283
17  Grange Rd                2093
220 Woodville Rd             2092
                             ...
Zone D Arndale Interchange      2
15 Portrush Rd                  2
11 East Av                      1
148 Portrush Rd                 1
151 Portrush Rd                 1
Name: StopName, Length: 92, dtype: int64
```

```
[28] ## Correlation
     plt.figure(figsize=(25,25))
     ax = sns.heatmap(df.corr(), cmap = "coolwarm", annot=True, linewidth=2)
```

```
<ipython-input-28-6eb7a2dfb33e>:3: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a future version, it will default to False. Sel
  ax = sns.heatmap(df.corr(), cmap = "coolwarm", annot=True, linewidth=2)
```



# CONCLUSION:

we summarize the key findings, insights, and achievements of our entire project. This section serves as a culminating perspective, bringing together the various phases and efforts undertaken to address the challenges and opportunities in public transportation.

Throughout the project, we explored the public bus transport dataset, from its initial design and problem definition to the practical implementation of data preprocessing, analysis, and modeling. We tackled real-world issues related to public transportation efficiency and strove to find actionable solutions.

In this section, we encapsulate the journey by highlighting the project's key outcomes, the lessons learned, and any actionable recommendations derived from our analysis. This conclusion signifies the successful completion of our public transportation efficiency analysis and paves the way for practical applications and informed decisions in the realm of public transportation.