PHASE-3
Development Part 1

DATE	**25-10-2023**
TEAM ID	**9277**
PROJECT NAME	**8301-PUBLIC TRANSPORTATION EFFICIENCY ANALYSIS**
TEAM NAME	**PROJ_207140_TEAM_1**

ANALYTICS OBJECTIVES

Data Preprocessing:

1. Data Collection
2. Data Inspection
3. Data Cleaning
4. Data Transformation
5. Data Splitting
6. Data Normalization
7. Data Validation
8. Data Visualization

1. Loading Data:

- Use pandas .read_csv()to load data from a CSV file.
- Use pandas .read_excel()for Excel files.

```
In [40]: import pandas as pd
         df=pd.read_csv("C:\transportexcel.csv")
```

2. Exploring Data:

- Use df.head() to view the first few rows of the dataset.

```
In [41]: df.head()
```

Out[41]:

	TripID	RouteID	StopID	StopName	WeekBeginning	NumberOfBoardings
0	23631	100	14156	181 Cross Rd	2013-06-30	1
1	23631	100	14144	177 Cross Rd	2013-06-30	1
2	23632	100	14132	175 Cross Rd	2013-06-30	1
3	23633	100	12266	Zone A Arndale Interchange	2013-06-30	2
4	23633	100	14147	178 Cross Rd	2013-06-30	1

- Use df.info() to get information about data types and missing values.

```
In [42]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1074 entries, 0 to 1073
Data columns (total 6 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   TripID             1074 non-null   int64
 1   RouteID            1074 non-null   int64
 2   StopID             1074 non-null   int64
 3   StopName           1074 non-null   object
 4   WeekBeginning      1074 non-null   datetime64[ns]
 5   NumberOfBoardings  1074 non-null   int64
dtypes: datetime64[ns](1), int64(4), object(1)
memory usage: 50.5+ KB
```

- Use df.describe() for summary statistics python.

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

Out[6]:

	TripID	StopID	NumberOfBoardings
count	1.085723e+07	1.085723e+07	1.085723e+07
mean	2.952100e+04	1.366132e+04	4.743737e+00
std	1.960938e+04	1.971760e+03	9.382286e+00
min	7.900000e+01	1.000100e+04	1.000000e+00
25%	1.191700e+04	1.231100e+04	1.000000e+00
50%	2.747900e+04	1.334600e+04	2.000000e+00
75%	4.885800e+04	1.491600e+04	4.000000e+00
max	6.553500e+04	1.871500e+04	9.770000e+02

3. Handling Missing Values:

- Use df.isnull()to identify missing values.
- Use df.dropna()to handle missing values.

```
In [44]: df.isnull()
```

Out[44]:

	TripID	RouteID	StopID	StopName	WeekBeginning	NumberOfBoardings
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
...	...	...	...	...	...	...
1069	False	False	False	False	False	False
1070	False	False	False	False	False	False
1071	False	False	False	False	False	False
1072	False	False	False	False	False	False
1073	False	False	False	False	False	False

1074 rows × 6 columns

4. Data Cleaning:

- Remove duplicates rows with df.drop_duplicates().
- Rename columns using df.rename() if necessary.
- Convert datatypes with df.astype().

```
In [48]: df.drop_duplicates()
```

Out[48]:

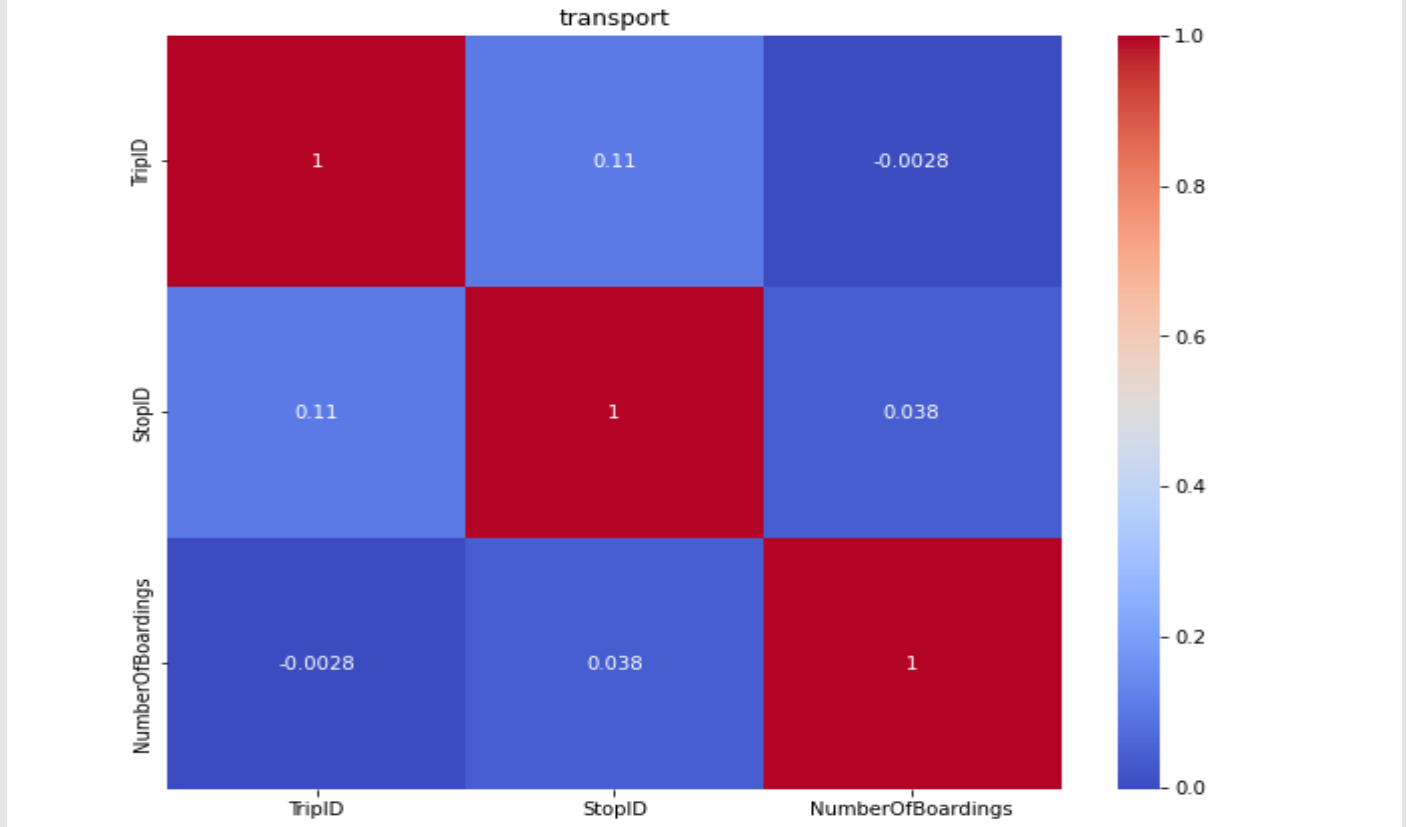
	TripID	RouteID	StopID	StopName	WeekBeginning	NumberOfBoardings
0	23631	100	14156	181 Cross Rd	2013-06-30	1
1	23631	100	14144	177 Cross Rd	2013-06-30	1
2	23632	100	14132	175 Cross Rd	2013-06-30	1
3	23633	100	12266	Zone A Arndale Interchange	2013-06-30	2
4	23633	100	14147	178 Cross Rd	2013-06-30	1
...	...	...	...	...	...	...
1069	44705	100	14124	174 Cross Rd	2013-06-30	3
1070	44705	100	14147	178 Cross Rd	2013-06-30	2
1071	44705	100	12216	224 Woodville Rd	2013-06-30	1
1072	44705	100	14024	10 Marion Rd	2013-06-30	2
1073	44705	100	14112	171 Cross Rd	2013-06-30	1

1074 rows × 6 columns

5. Handling Outliers:

- Detect and deal with outliers using statistical methods or visualization.
- You can use techniques like z-scores or IQR(Interquartile Range)

```
In [54]: import seaborn as sns
         import matplotlib.pyplot as plt
         corr_matrix = df.corr()
         plt.figure(figsize=(10,8))
         sns.heatmap(corr_matrix,annot=True,cmap="coolwarm")
         plt.title("transport")
         plt.show()
```




```
In [ ]:
```

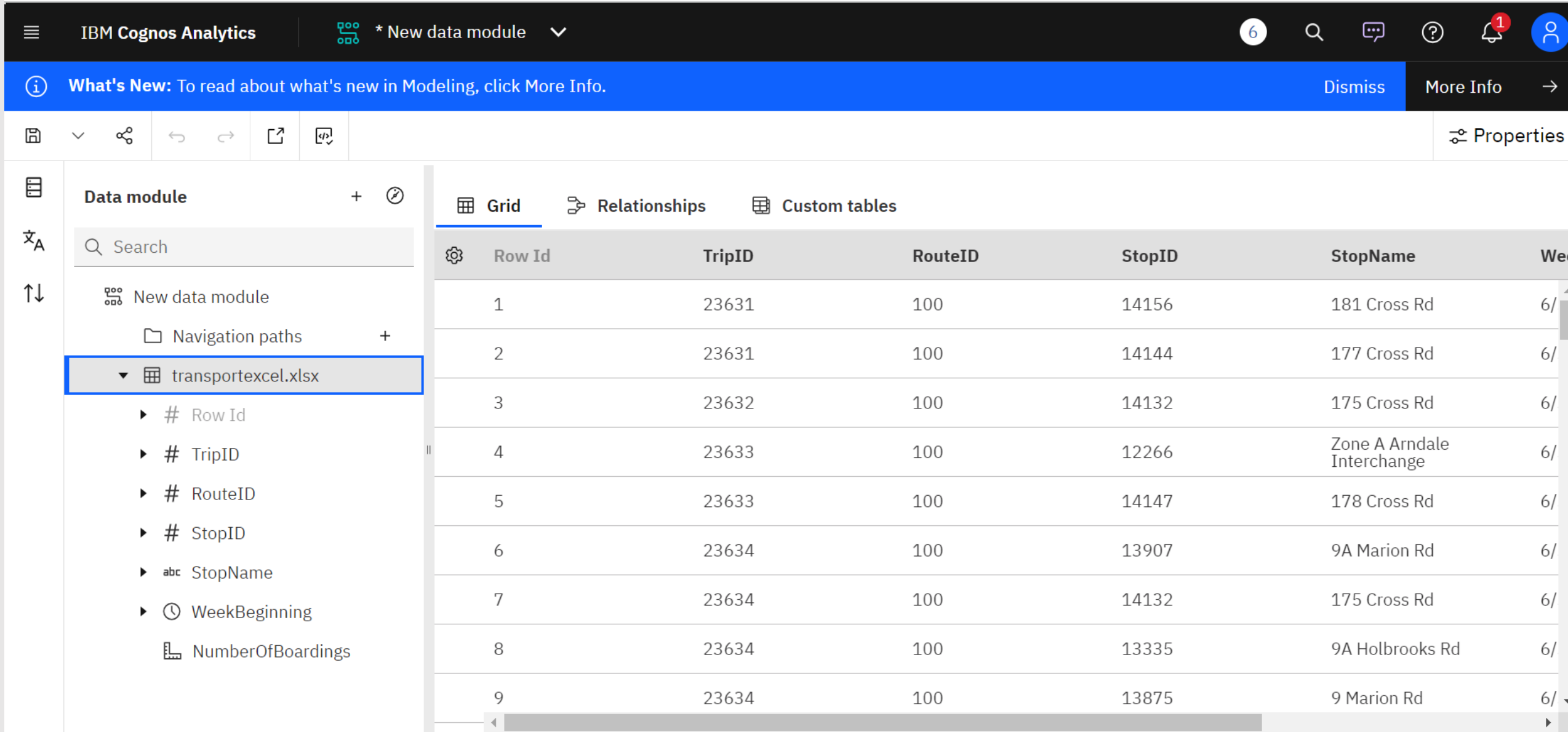
6. Saving Data:

- Save the preprocessed data back to a file if needed

```
df.to_csv('Downloads/preprocessed_transportexcel.csv',index=False)
```

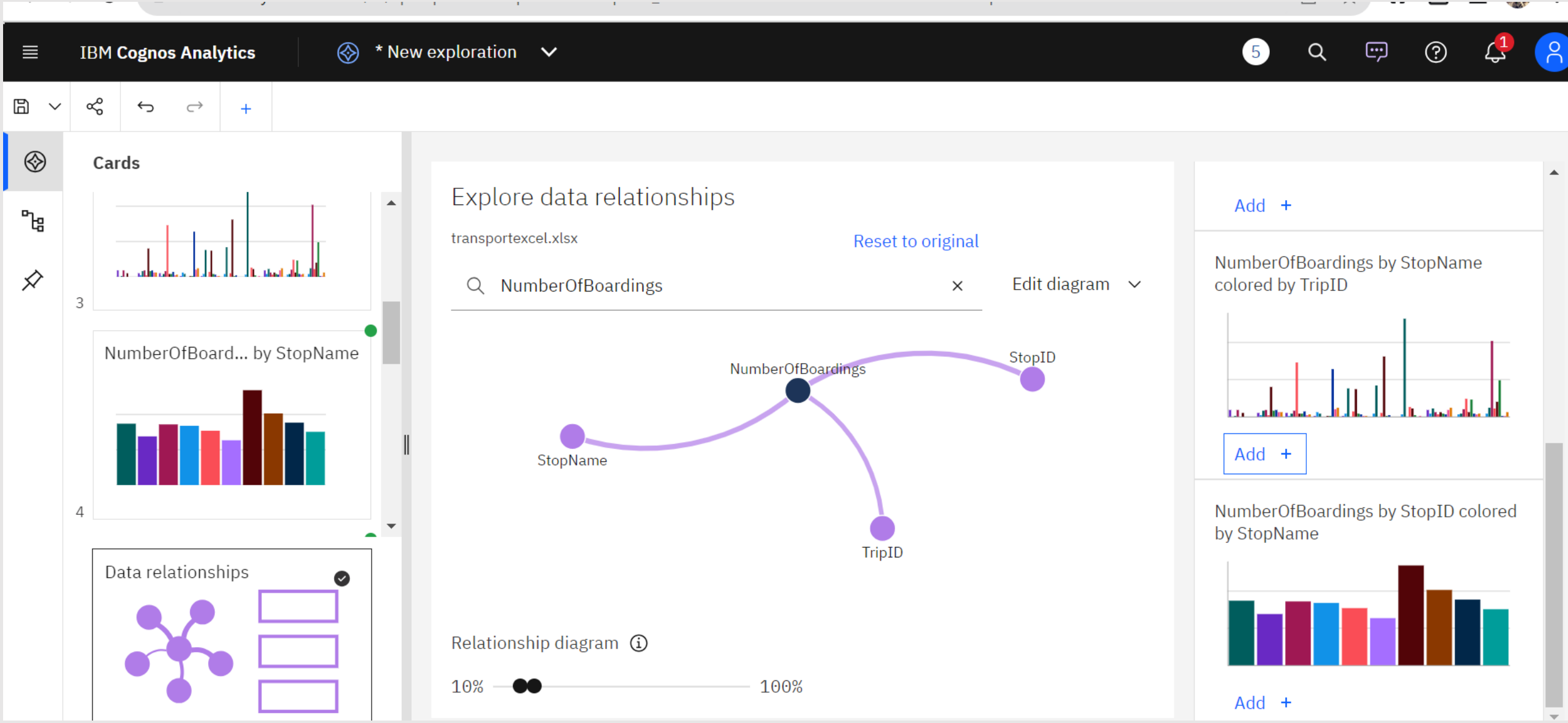
IBM COGNOS ANALYTICS

IN COGNOS-DATA LOADING

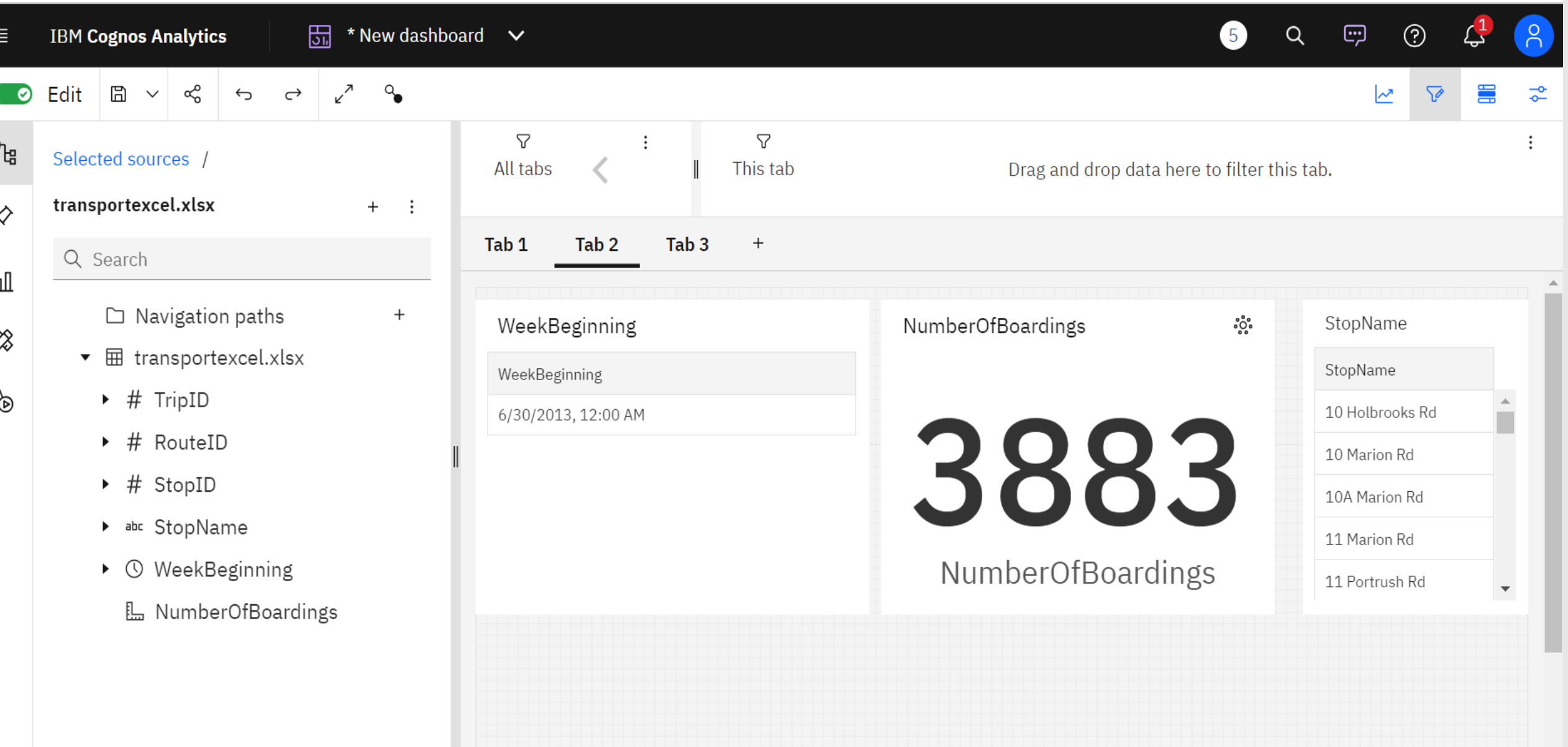


Row Id	TripID	RouteID	StopID	StopName	We
1	23631	100	14156	181 Cross Rd	6/
2	23631	100	14144	177 Cross Rd	6/
3	23632	100	14132	175 Cross Rd	6/
4	23633	100	12266	Zone A Arndale Interchange	6/
5	23633	100	14147	178 Cross Rd	6/
6	23634	100	13907	9A Marion Rd	6/
7	23634	100	14132	175 Cross Rd	6/
8	23634	100	13335	9A Holbrooks Rd	6/
9	23634	100	13875	9 Marion Rd	6/

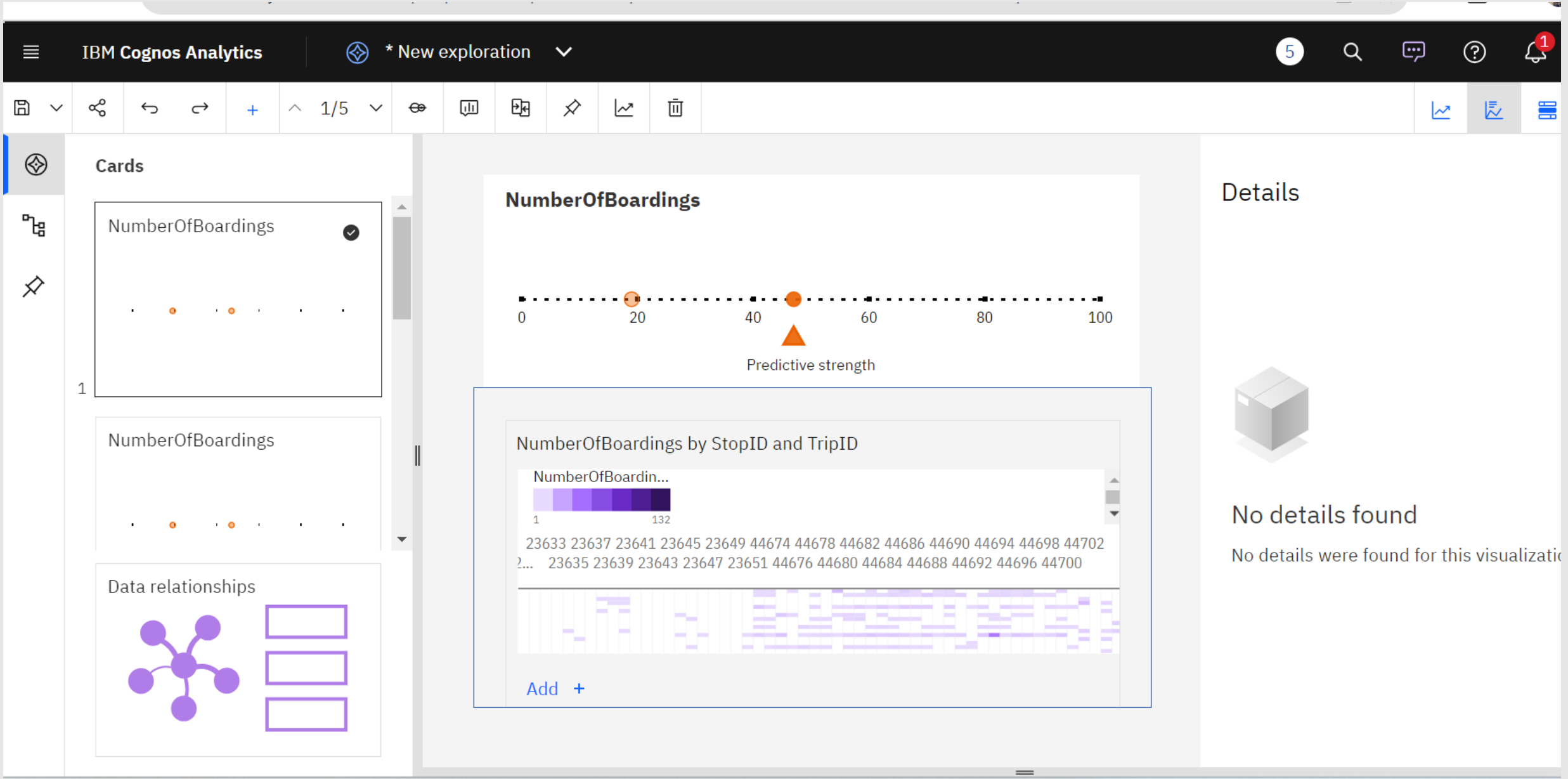
IN COGNOS-DATA RELATIONSHIP



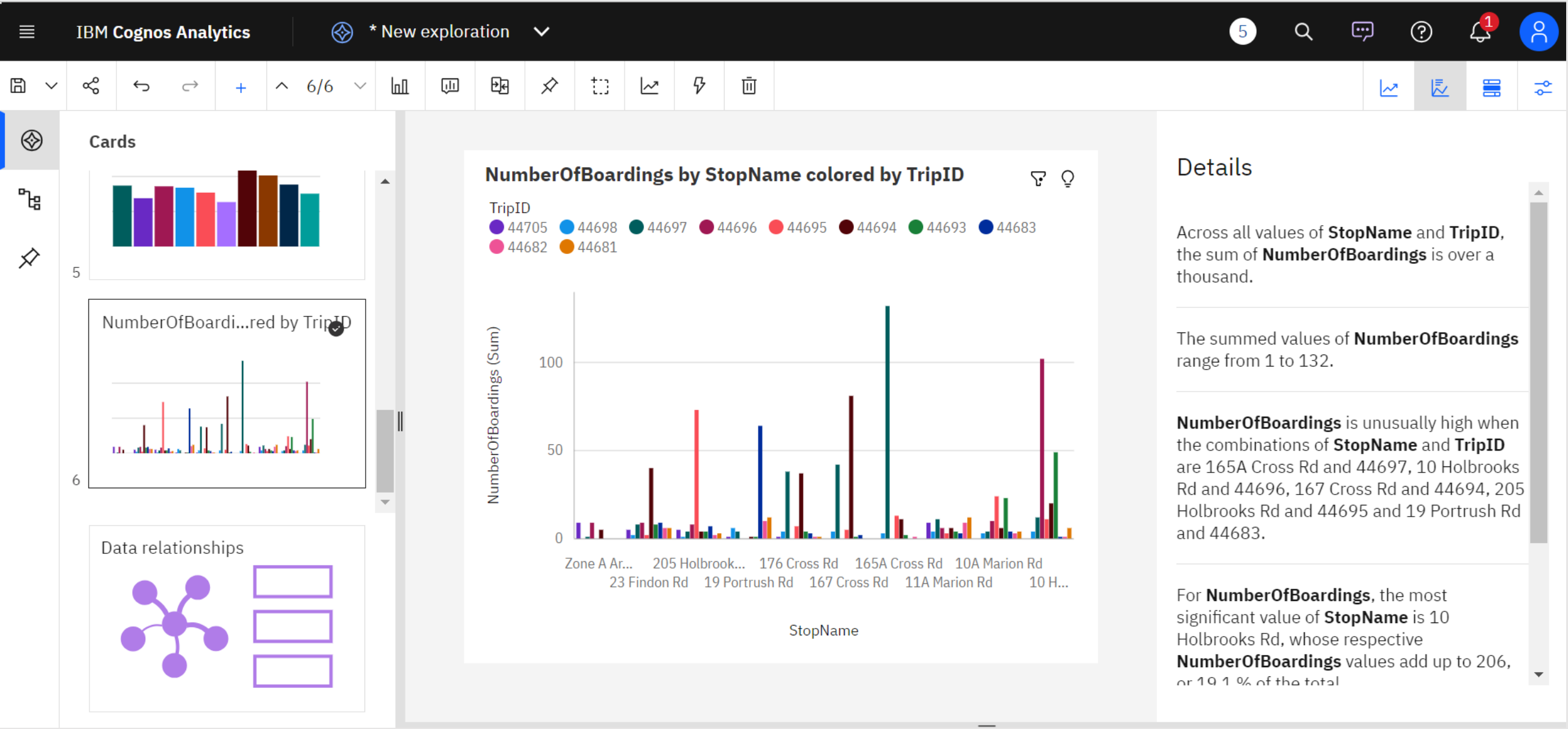
IN COGNOS -TRANSPORT DASHBOARD



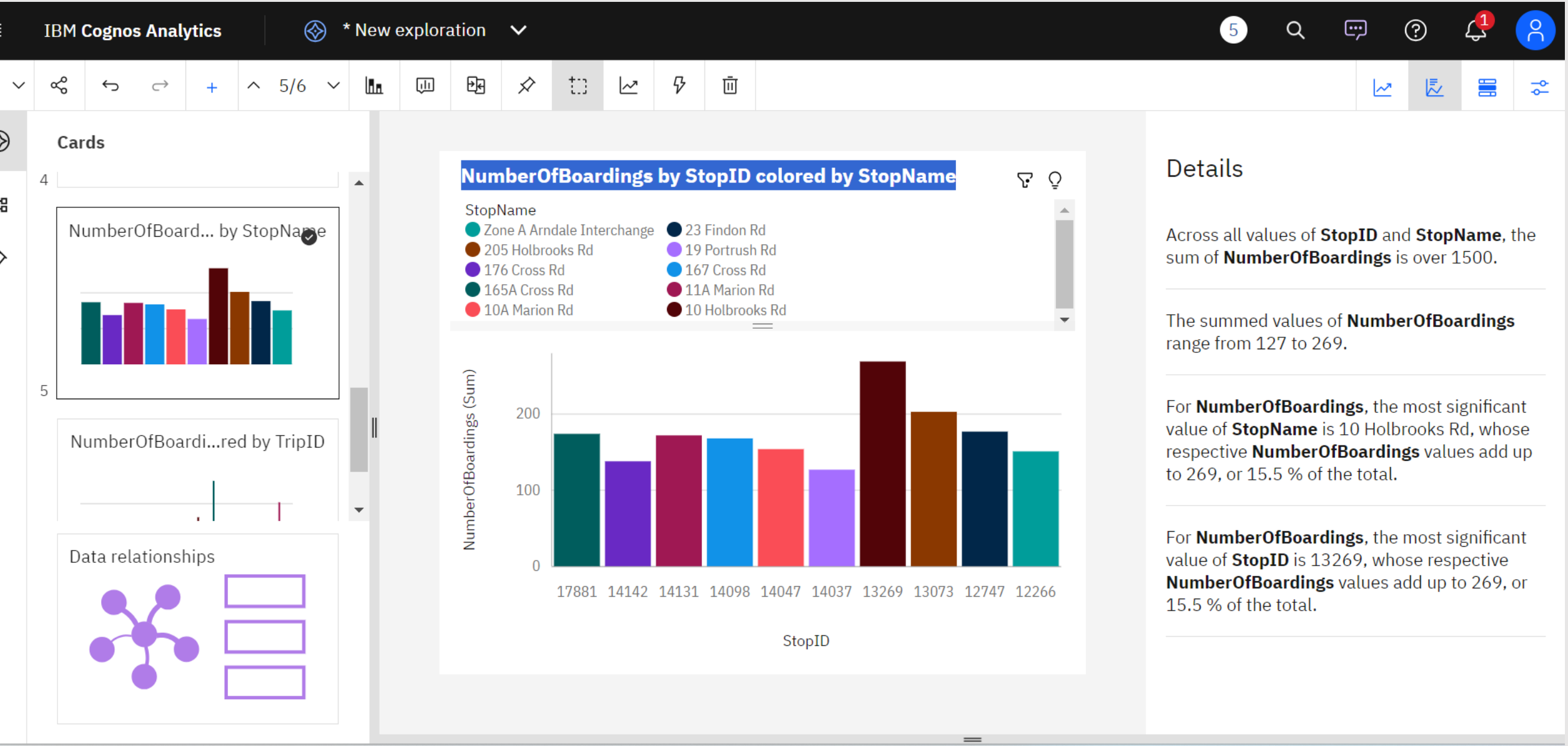
IN COGNOS-NUMBER OF BOARDINS



IN-COGNOS NUMBEROFBOARDINGS BY STOPNAME COLORED BY TRIPID



IN-COGNOS NUMBEROFBOARDINGS BY STOPID COLORED BY STOPNAME



CONCULSION

Data preprocessing is a crucial step in analyzing public transportation efficiency.It involves data collection,data cleaning,data transformation,data aggregation.The main steps include data collection,data inspection ,cleansing,data transformation,data splitting,normalization,data validation.

By effectively preprocessing public transportation data,we can derive meaningful insights to improve efficiency, optimize routes, and enhance overall transportation system.