DAC_PHASE 3

Date :26/10/2023

Project Title :Public Transportation Efficiency Analysis

Importing The Dependencies

In [2]:

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

In [5]:

```
data = pd.read_csv("C://Users//Indarjith K//Desktop//Indrajithdataset.csv")
```

```
C:\Users\Indarjith K\AppData\Local\Temp\ipykernel_10320\2758608790.py:1: D
typeWarning: Columns (1) have mixed types. Specify dtype option on import
or set low_memory=False.
  data = pd.read_csv("C://Users//Indarjith K//Desktop//Indrajithdataset.cs
v")
```

In [6]:
```
data
```

Out[6]:

	TripID	RouteID	StopID	StopName	WeekBeginning	NumberOfBoardings
0	23631	100	14156	181 Cross Rd	30-06-2013 00:00	1
1	23631	100	14144	177 Cross Rd	30-06-2013 00:00	1
2	23632	100	14132	175 Cross Rd	30-06-2013 00:00	1
3	23633	100	12266	Zone A Arndale Interchange	30-06-2013 00:00	2
4	23633	100	14147	178 Cross Rd	30-06-2013 00:00	1
...	...	...	...	...	...	...
1048570	45682	171	13929	8 Fullarton Rd	29-09-2013 00:00	2
1048571	45682	171	13758	3 Glen Osmond Rd	29-09-2013 00:00	3
1048572	45682	171	13967	9 Fullarton Rd	29-09-2013 00:00	1
1048573	45682	171	13808	5 Fullarton Rd	29-09-2013 00:00	1
1048574	45682	171	13845	6 Fullarton Rd	29-09-2013 00:00	3

1048575 rows × 6 columns

EXPLORING THE DATASET

1. Displaying The Top 5 Rows

In [7]:
```
data.head()
```

Out[7]:

	TripID	RouteID	StopID	StopName	WeekBeginning	NumberOfBoardings
0	23631	100	14156	181 Cross Rd	30-06-2013 00:00	1
1	23631	100	14144	177 Cross Rd	30-06-2013 00:00	1
2	23632	100	14132	175 Cross Rd	30-06-2013 00:00	1
3	23633	100	12266	Zone A Arndale Interchange	30-06-2013 00:00	2
4	23633	100	14147	178 Cross Rd	30-06-2013 00:00	1

2. Displaying The Bottom 5 Rows

```
In [8]: data.tail()
```

Out[8]:

	TripID	RouteID	StopID	StopName	WeekBeginning	NumberOfBoardings
1048570	45682	171	13929	8 Fullarton Rd	29-09-2013 00:00	2
1048571	45682	171	13758	3 Glen Osmond Rd	29-09-2013 00:00	3
1048572	45682	171	13967	9 Fullarton Rd	29-09-2013 00:00	1
1048573	45682	171	13808	5 Fullarton Rd	29-09-2013 00:00	1
1048574	45682	171	13845	6 Fullarton Rd	29-09-2013 00:00	3

3. Find The Shape Of The Dataset

```
In [9]: data.shape
```

```
Out[9]: (1048575, 6)
```

4. Displaying The Information

In [10]:
```
data.info
```

Out[10]:
```
<bound method DataFrame.info of          TripID RouteID  StopID
StopName     WeekBeginning  \
0        23631     100   14156                181 Cross Rd  30-06-2013 0
0:00
1        23631     100   14144                177 Cross Rd  30-06-2013 0
0:00
2        23632     100   14132                175 Cross Rd  30-06-2013 0
0:00
3        23633     100   12266  Zone A Arndale Interchange  30-06-2013 0
0:00
4        23633     100   14147                178 Cross Rd  30-06-2013 0
0:00
...        ...     ...     ...                         ...
...
1048570  45682     171   13929              8 Fullarton Rd  29-09-2013 0
0:00
1048571  45682     171   13758            3 Glen Osmond Rd  29-09-2013 0
0:00
1048572  45682     171   13967              9 Fullarton Rd  29-09-2013 0
0:00
1048573  45682     171   13808              5 Fullarton Rd  29-09-2013 0
0:00
1048574  45682     171   13845              6 Fullarton Rd  29-09-2013 0
0:00

         NumberOfBoardings
0                        1
1                        1
2                        1
3                        2
4                        1
...                    ...
1048570                  2
1048571                  3
1048572                  1
1048573                  1
1048574                  3

[1048575 rows x 6 columns]>
```

5. Cheking For Null Values

In [11]:
```
data.isnull().sum()
```

Out[11]:
```
TripID               0
RouteID              0
StopID               0
StopName             0
WeekBeginning        0
NumberOfBoardings    0
dtype: int64
```

6. Check For Duplicate And Drop Them

In [12]:

```
dup = data.duplicated().any()
```

In [13]:

```
print(dup)
```

```
False
```

7. Get The Entire Statistics Of The Data

In [14]:

```
data.describe()
```

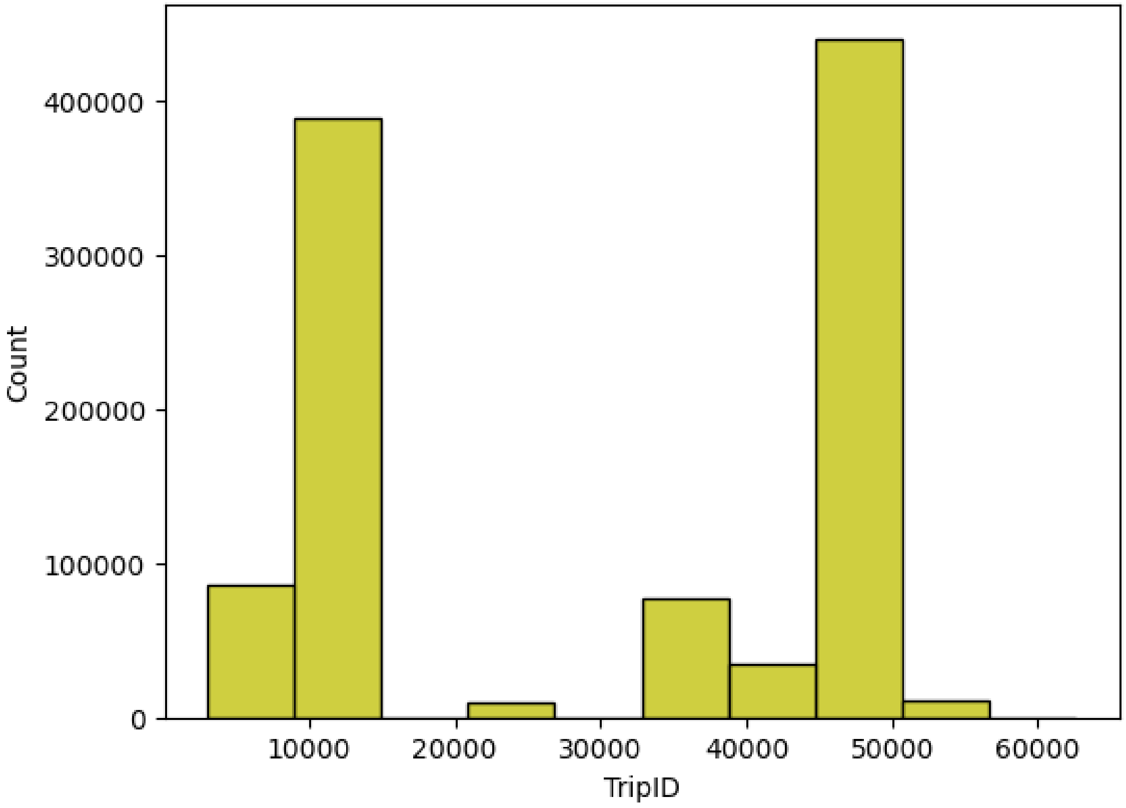
Out[14]:

	TripID	StopID	NumberOfBoardings
count	1.048575e+06	1.048575e+06	1.048575e+06
mean	2.860299e+04	1.330114e+04	4.132290e+00
std	1.674656e+04	1.119243e+03	6.291338e+00
min	3.017000e+03	1.081700e+04	1.000000e+00
25%	1.162200e+04	1.269800e+04	1.000000e+00
50%	3.423400e+04	1.333500e+04	2.000000e+00
75%	4.512600e+04	1.371600e+04	4.000000e+00
max	6.258500e+04	1.849300e+04	1.930000e+02

VISUALISING THE DATA

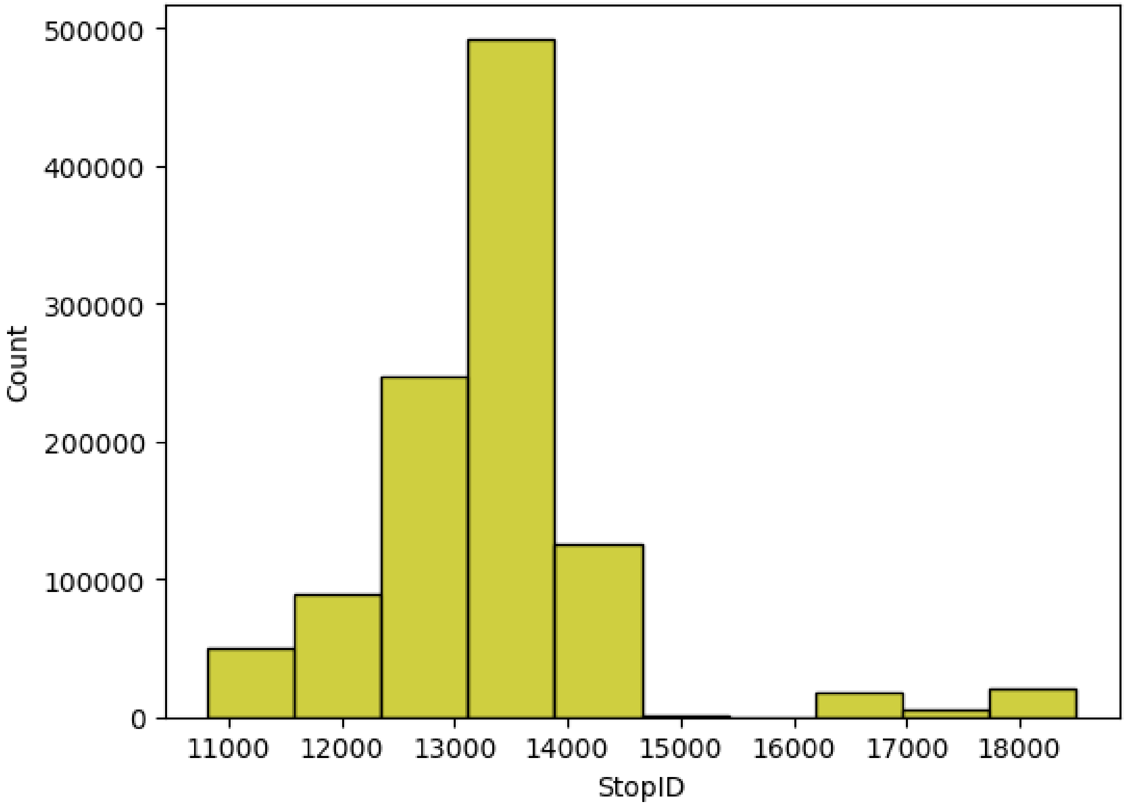
```
In [37]: sns.histplot(data, x='TripID', bins=10, color='y')

Out[37]: <Axes: xlabel='TripID', ylabel='Count'>
```



```
In [39]: sns.histplot(data, x='StopID', bins=10, color='y')

Out[39]: <Axes: xlabel='StopID', ylabel='Count'>
```

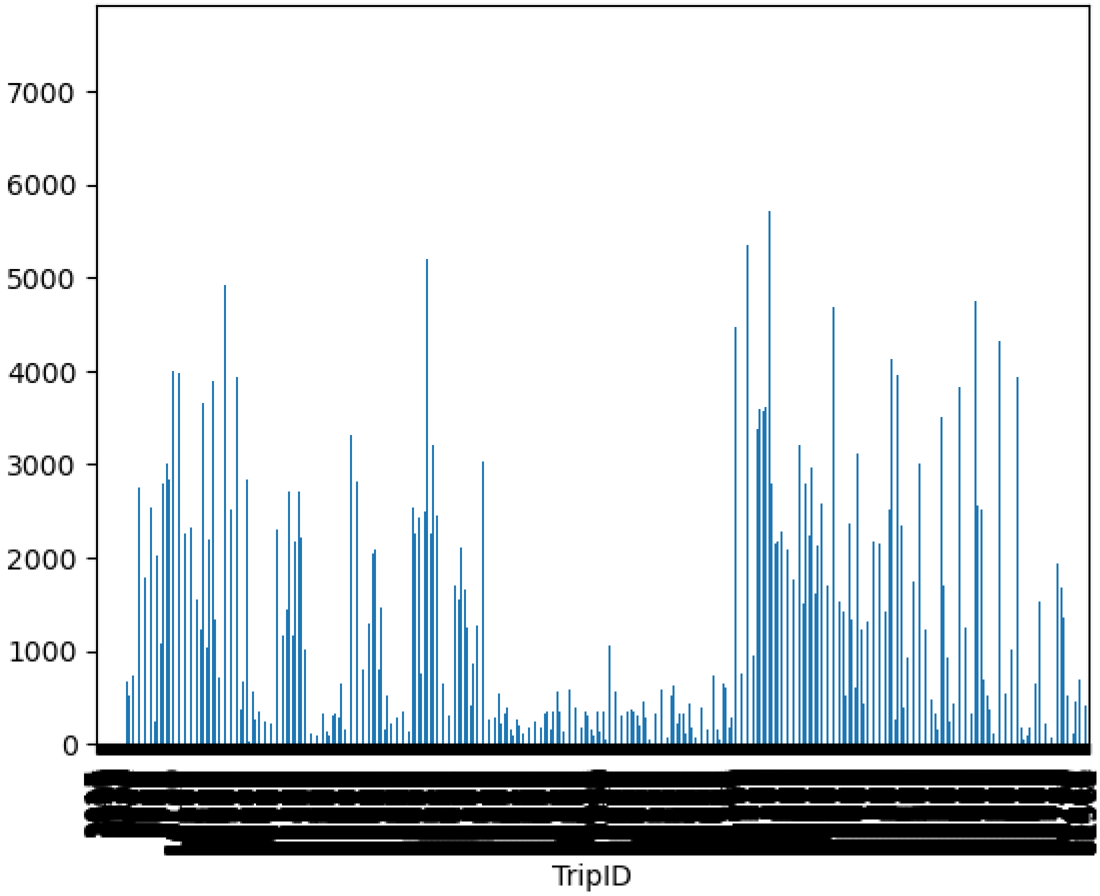


```
In [40]: M=(data.groupby('TripID')['NumberOfBoardings']).sum()
```

```
In [41]: M
```

```
Out[41]: TripID
         3017      2
         3020      2
         3021      1
         3022      3
         3023      1
                  ..
         62581     4
         62582    11
         62583     4
         62584    11
         62585    11
         Name: NumberOfBoardings, Length: 3299, dtype: int64
```

```
In [42]: M.plot.bar()
         plt.show()
```

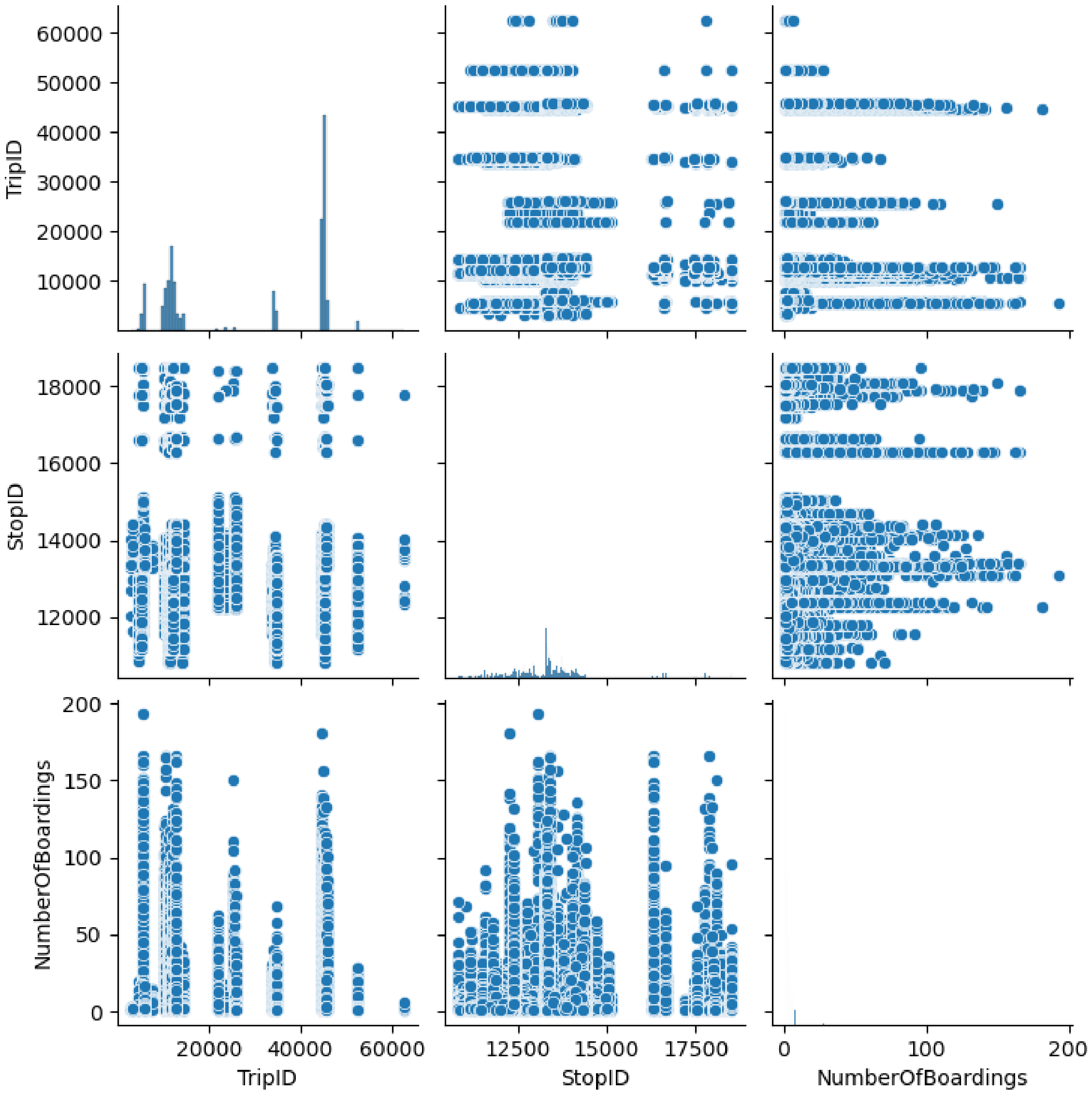


In [43]:
```
plt.figure(figsize=(12,8))
sns.pairplot(data)
```

```
C:\Users\Indarjith K\anaconda3\Lib\site-packages\seaborn\axisgrid.py:118:
UserWarning: The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```

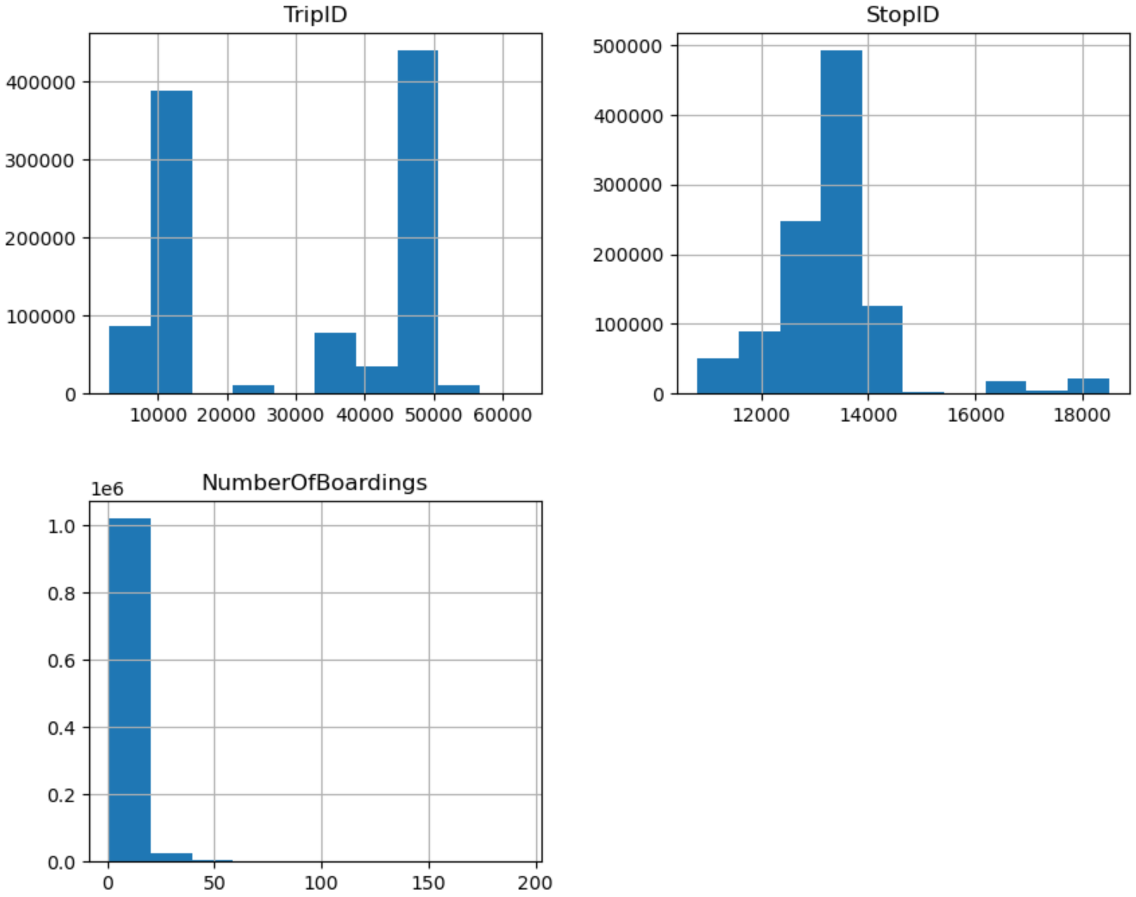
Out[43]:
```
<seaborn.axisgrid.PairGrid at 0x22e51e8c210>
```

```
<Figure size 1200x800 with 0 Axes>
```



In [44]:
```
data.hist(figsize=(10,8))
```

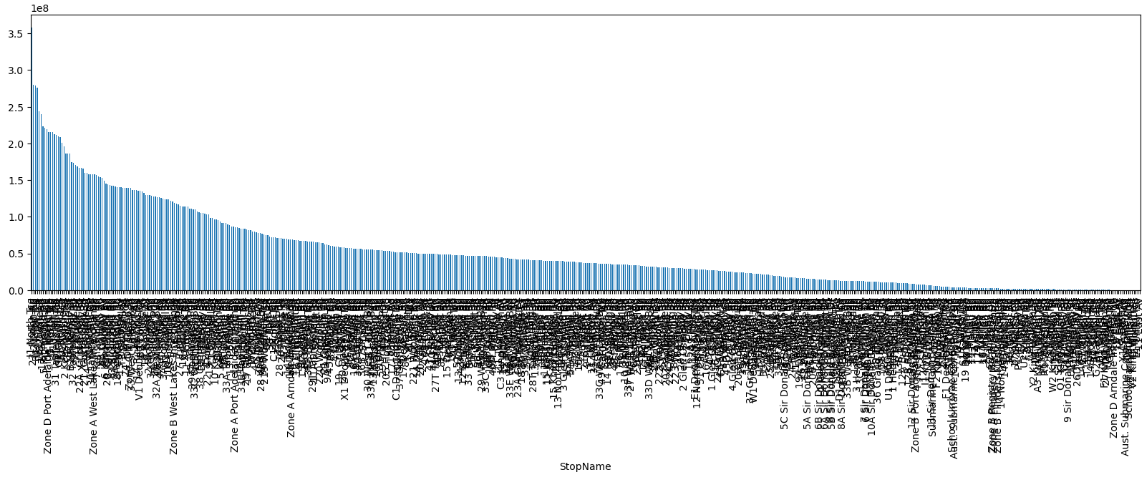
Out[44]:
```
array([[<Axes: title={'center': 'TripID'}>,
        <Axes: title={'center': 'StopID'}>],
       [<Axes: title={'center': 'NumberOfBoardings'}>, <Axes: >]],
      dtype=object)
```



In [46]:
```
C=data.groupby('StopName')['TripID'].sum().sort_values(ascending = False)
C
```

Out[46]:
```
StopName
I1 North Tce          357980471
23  Findon Rd         280075267
21 Port Rd            278666250
R1 North Tce          276122712
B1 East Tce           243863395
                        ...
X2 King William St        22448
V2 King William St        22444
I2 North Tce              12813
L1 Unley Rd               11221
11 East Av                 5613
Name: TripID, Length: 583, dtype: int64
```

In [54]:
```
C.plot.bar(figsize=(20,5))
plt.show()
```



How many passengers weekBeginning

In [62]:
```
WeekBeginning = data.groupby(['RouteID','WeekBeginning'])[['NumberOfBoarding
WeekBeginning
```

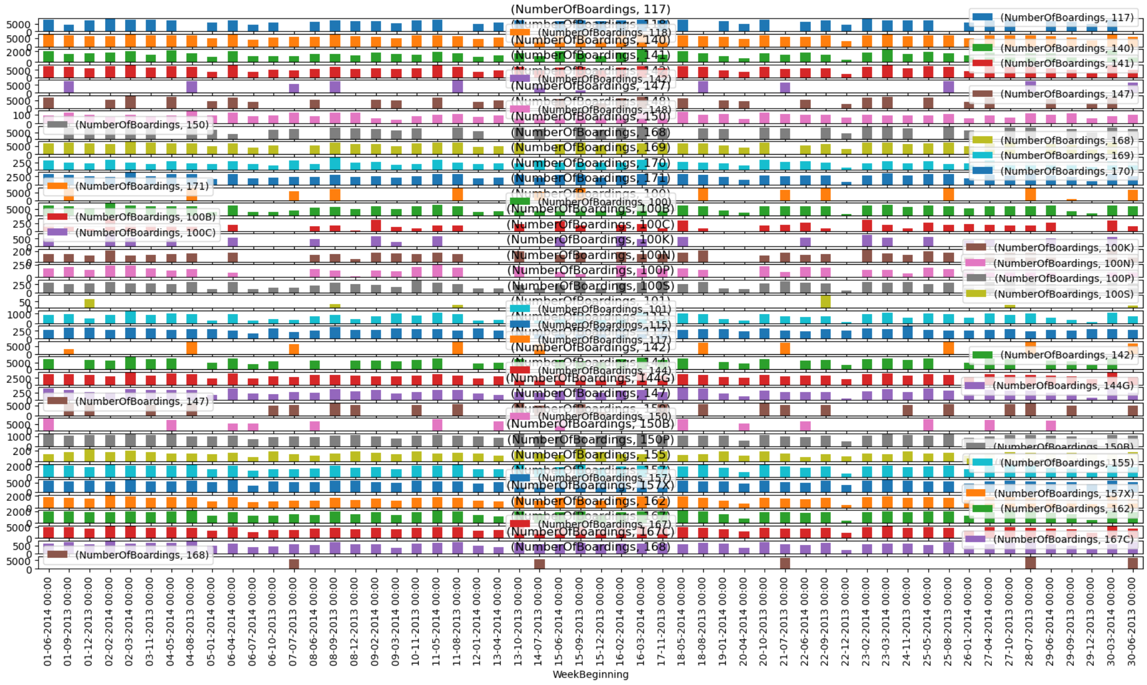
Out[62]:

RouteID	WeekBeginning	NumberOfBoardings
117	**01-06-2014 00:00**	7837
	01-09-2013 00:00	4435
	01-12-2013 00:00	7539
	02-02-2014 00:00	8272
	02-03-2014 00:00	8059
...	**...**	...
168	**07-07-2013 00:00**	5577
	14-07-2013 00:00	5411
	21-07-2013 00:00	6340
	28-07-2013 00:00	7046
	30-06-2013 00:00	6208

1519 rows × 1 columns

In [80]:

```
WeekBeginning.unstack(level=0).plot(kind='bar',subplots=True,figsize=(20,10)
plt.show()
```



In [81]:
```
data.corr
```

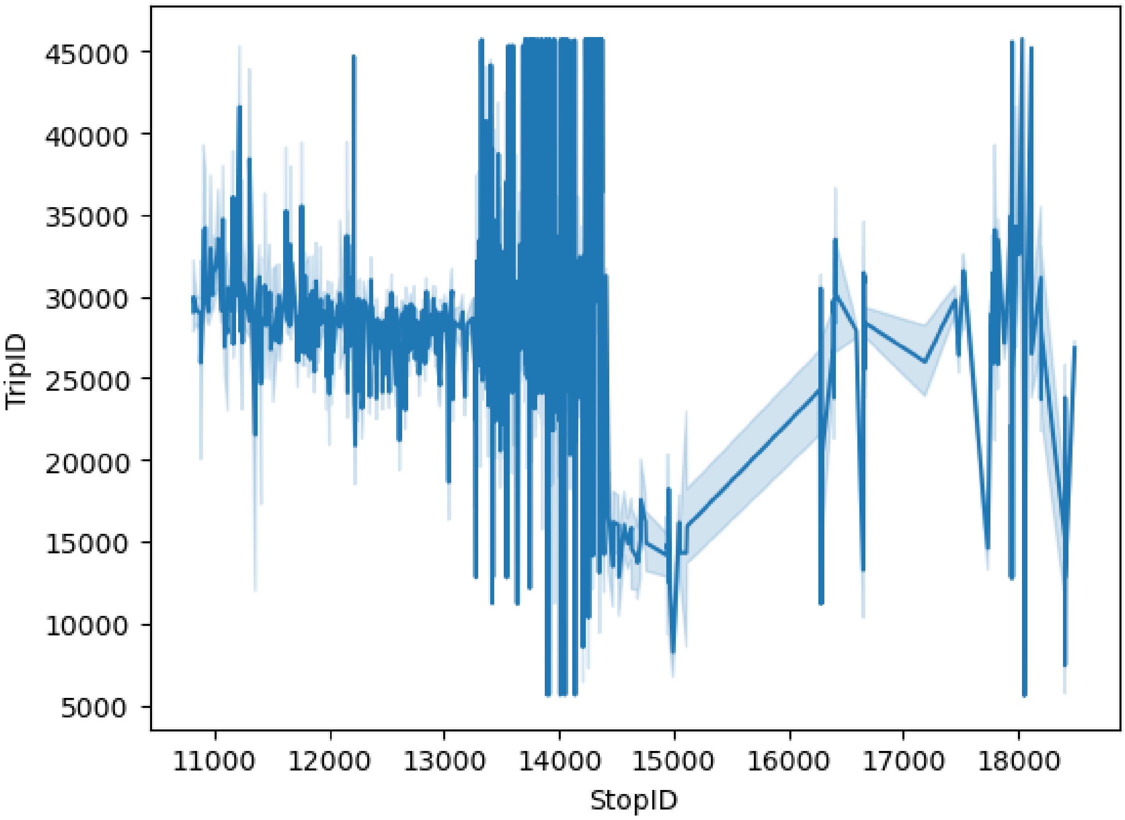
Out[81]:
```
<bound method DataFrame.corr of          TripID RouteID  StopID
StopName     WeekBeginning  \
0          23631     100   14156                181 Cross Rd  30-06-2013 0
0:00
1          23631     100   14144                177 Cross Rd  30-06-2013 0
0:00
2          23632     100   14132                175 Cross Rd  30-06-2013 0
0:00
3          23633     100   12266  Zone A Arndale Interchange  30-06-2013 0
0:00
4          23633     100   14147                178 Cross Rd  30-06-2013 0
0:00
...          ...     ...     ...                         ...
...
1048570    45682     171   13929              8 Fullarton Rd  29-09-2013 0
0:00
1048571    45682     171   13758            3 Glen Osmond Rd  29-09-2013 0
0:00
1048572    45682     171   13967              9 Fullarton Rd  29-09-2013 0
0:00
1048573    45682     171   13808              5 Fullarton Rd  29-09-2013 0
0:00
1048574    45682     171   13845              6 Fullarton Rd  29-09-2013 0
0:00

         NumberOfBoardings
0                        1
1                        1
2                        1
3                        2
4                        1
...                    ...
1048570                  2
1048571                  3
1048572                  1
1048573                  1
1048574                  3

[1048575 rows x 6 columns]>
```

```
In [110]: sns.lineplot(x="StopID", y="TripID", data=data)
          plt.show
```

```
Out[110]: <function matplotlib.pyplot.show(close=None, block=None)>
```



```
In [ ]:
```

```
In [ ]:
```