PUBLIC TRANSPORTATION EFFICIENCY ANALYSIS

Reports for on-time performance in public transportation

Creating reports for on-time performance in public transportation involves presenting data about the punctuality of services, analyzing trends, and identifying areas for improvement.

- On-Time Percentage: Percentage of services that operate on time.
- Average Delay Time: Average delay in minutes for late services.
- Service Frequency: Number of services operated per day/hour.
- Peak Hour Performance: On-time performance during peak hours.
- Analyze on-time performance for different routes or lines.
- Identify routes with consistent delays and routes with exemplary punctuality.
- Categorize delays (e.g., weather, traffic, technical issues) and analyze their impact on on-time performance.

Passenger feedback in public transportation

Analyzing passenger feedback in public transportation is crucial for improving service quality, identifying issues, and ensuring customer satisfaction.

- Implement feedback collection channels, including onboard surveys, mobile apps, websites, and station suggestion boxes.
- Encourage passengers to provide feedback through incentives or acknowledgment programs.
- Gather feedback on various aspects such as punctuality, cleanliness, staff behavior, safety, and amenities.

Service efficiency metrics in public transportation

Service efficiency metrics in public transportation are vital for evaluating the effectiveness and productivity of transit systems. These metrics provide insights into the system's performance, helping authorities optimize operations, enhance passenger experience, and allocate resources effectively.

- On-Time Performance (OTP): The percentage of services arriving or departing within a defined window of the scheduled time. Often calculated as (Number of On-Time Services / Total Number of Services) * 100%.

- Service Frequency: The number of services (buses, trains, etc.) operating on a specific route within a given time period.
- Headway: The time interval between consecutive services on the same route. Shorter headways indicate higher frequency and potentially better service.
- Travel Time: The duration it takes for a vehicle to travel between two specific points. Variability in travel time can affect passenger convenience.
- Journey Reliability: The consistency in travel time. A reliable service ensures passengers can predict their travel time accurately.

Calculating service punctuality rates

Source code:

```
import pandas as pd
services['delay'] = services['actual_time'] - services['scheduled_time']
delay_threshold = 5
on_time_services = len(services[services['delay'] <=
delay_threshold])
total_services = len(services)
punctuality_rate = (on_time_services / total_services) * 100
print(f"Punctuality Rate: {punctuality_rate:.2f}%")
```

Sentiment analysis on passenger feedback in python

Source Code:

```
from textblob import TextBlob


feedbacks = [
   "The service was excellent and the staff was very helpful.",
   "The bus was delayed and the staff was rude.",
   "I had a pleasant experience with the Bus.",

]


def analyze_sentiment(feedback):
   analysis = TextBlob(feedback)
```

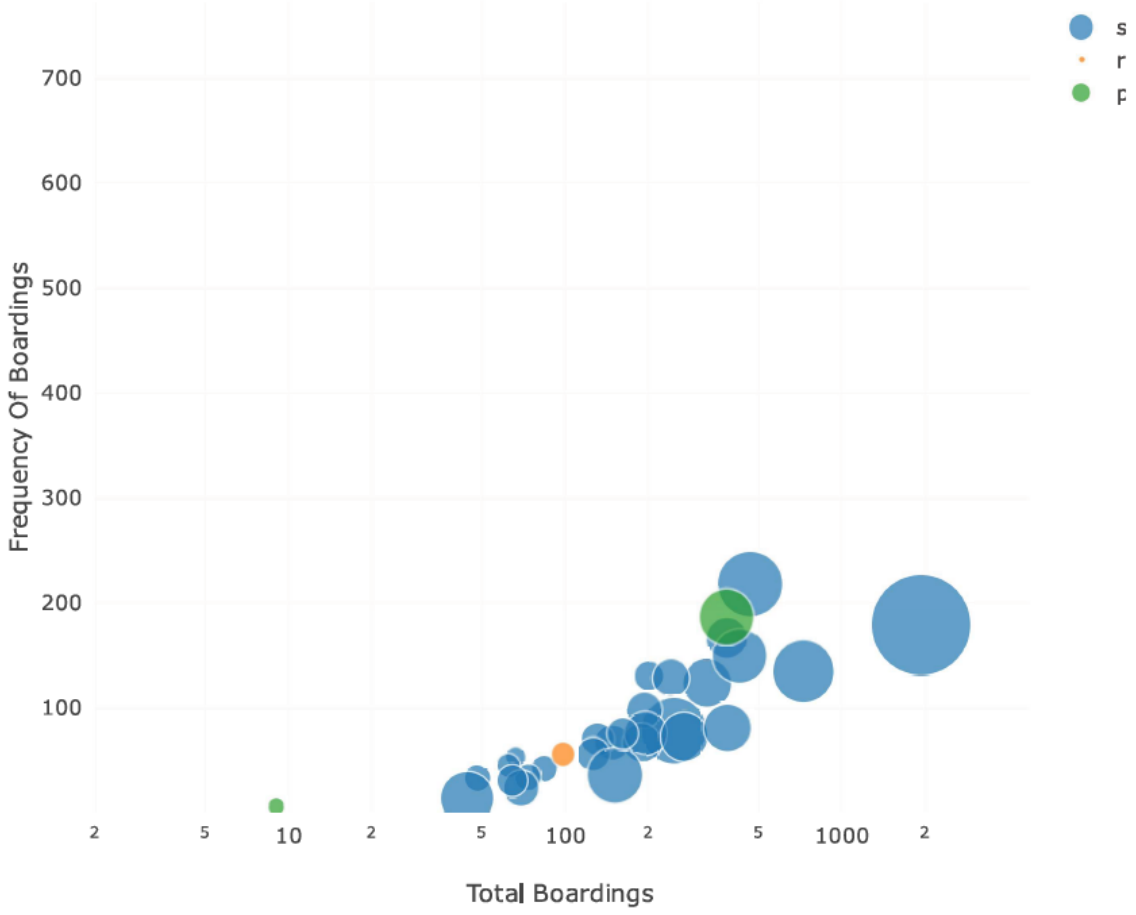
```
    if analysis.sentiment.polarity > 0:
        return "Positive"
    elif analysis.sentiment.polarity < 0:
        return "Negative"
    else:
        return "Neutral"


for feedback in feedbacks:
    sentiment = analyze_sentiment(feedback)
    print(f"Feedback: '{feedback}'")
    print(f"Sentiment: {sentiment}")
    print("-" * 30)
```

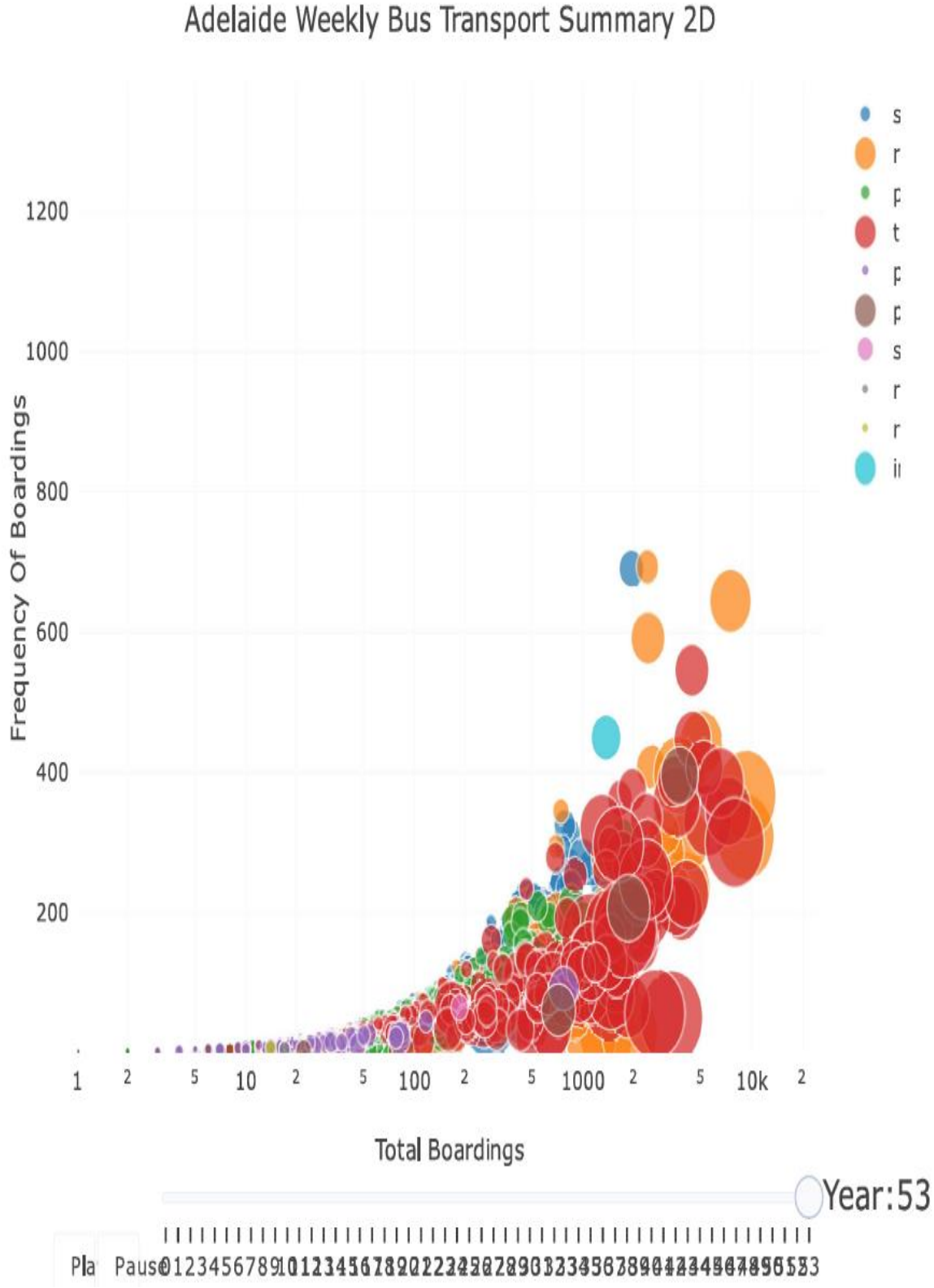
	TripID	RouteID	StopID	StopName	WeekBeginning	NumberOfBoardings	formatted_address	latitude	longitude	postcode	type
0	23631	100	14156	181 Cross Rd	2013-06-30	1	181 Cross Rd, Westbourne Park SA 5041, Australia	-34.966656	138.592148	5041	street_address
1	23631	100	14144	177 Cross Rd	2013-06-30	1	177 Cross Rd, Westbourne Park SA 5041, Australia	-34.966607	138.592301	5041	street_address
2	23632	100	14132	175 Cross Rd	2013-06-30	1	175 Cross Rd, Westbourne Park SA 5041, Australia	-34.966758	138.592715	5041	street_address

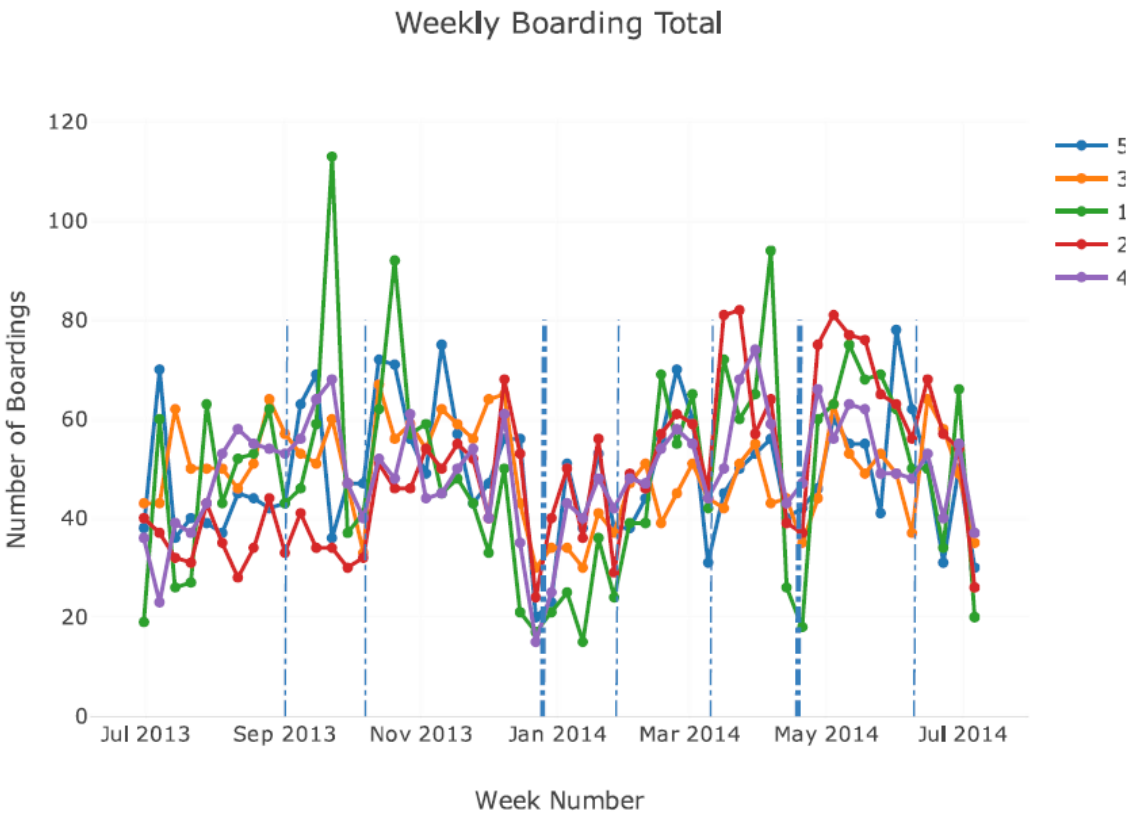
```
TripID                    0
RouteID                   0
StopID                    0
StopName                  0
WeekBeginning             0
NumberOfBoardings         0
formatted_address      3506
latitude                  0
longitude                 0
postcode             425081
type                      0
route_desc           2106618
dist_from_centre          0
holiday_label             0
dtype: int64
```

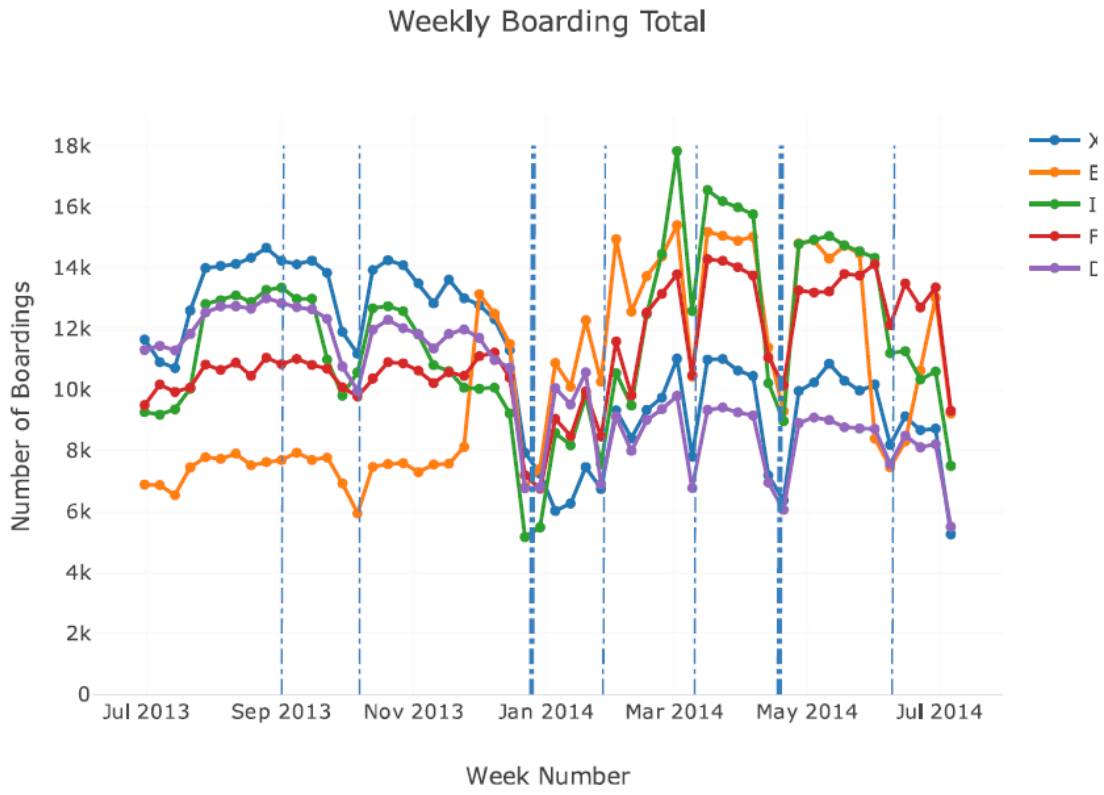
	StopName	WeekBeginning	type	NumberOfBoardings_sum	NumberOfBoardings_count	NumberOfBoardings_max
0	1 Anzac Hwy	2013-06-30	street_address	1003	378	51
1	1 Anzac Hwy	2013-07-07	street_address	783	360	28
2	1 Anzac Hwy	2013-07-14	street_address	843	343	45
3	1 Anzac Hwy	2013-07-21	street_address	710	356	28
4	1 Anzac Hwy	2013-07-28	street_address	898	379	41

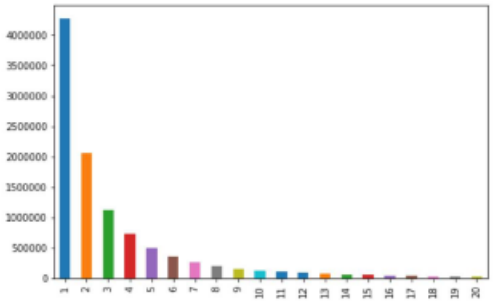
Visualization




Adelaide Weekly Bus Transport Summary 2D
Frequency Of Boardings
1200
1000
800
600
400
200
1
2
5
10
2
5
100
2
5
1000
2
5
10k
2
Total Boardings
Year:53
Pla
Paus


Weekly Boarding Total
Number of Boardings
120
100
80
60
40
20
0
Jul 2013
Sep 2013
Nov 2013
Jan 2014
Mar 2014
May 2014
Jul 2014
Week Number
5
3
1
2
4


Weekly Boarding Total
Number of Boardings
18k
16k
14k
12k
10k
8k
6k
4k
2k
0
Jul 2013
Sep 2013
Nov 2013
Jan 2014
Mar 2014
May 2014
Jul 2014
Week Number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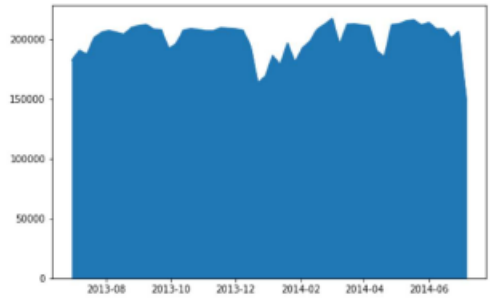
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2013-10
2013-12
2014-02
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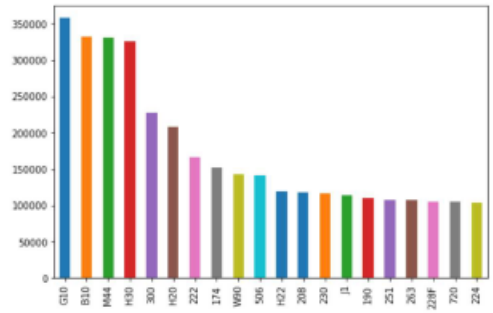
2014-06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J1
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251
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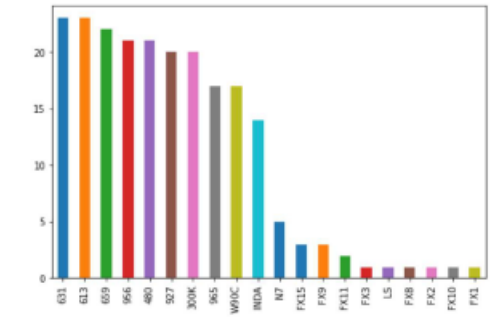
720
224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W90C
RNDA
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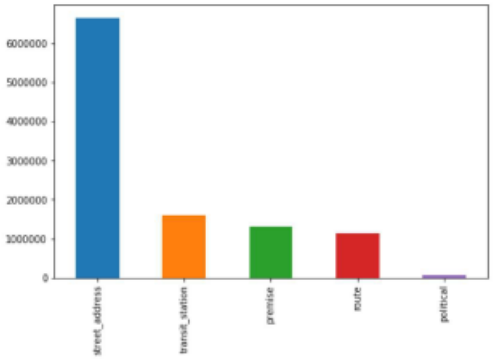
FX15
FX9
FX11
FX3
L5
FX8
FX2
FX10
FX1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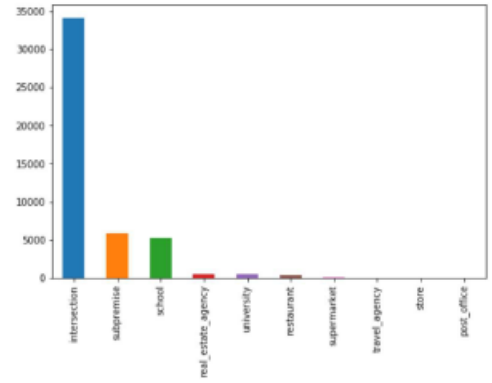
street_address
transit_station
premise
route
political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intersection
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university
restaurant
supermarket
travel_agency
store
post_office