BIKE N ROLL

CLOUD COMPUTING - PROJECT REPORT

Team Members

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INTRODUCTION:

Bike-n-Roll is a dock less bike rental mobile application developed on android platform hosted on AWS. The main features of this application is that it enables user to search for bikes nearby and then user can book a bike and end his ride wherever he wants without worrying about the docks. And at the end of the bike the user can view his past history like the last time he booked the bike, start location, end location and the distance covered by him. One of the additional features that comes with our application is that user can listen to daily news while riding his bike.

ARCHITECTURE:

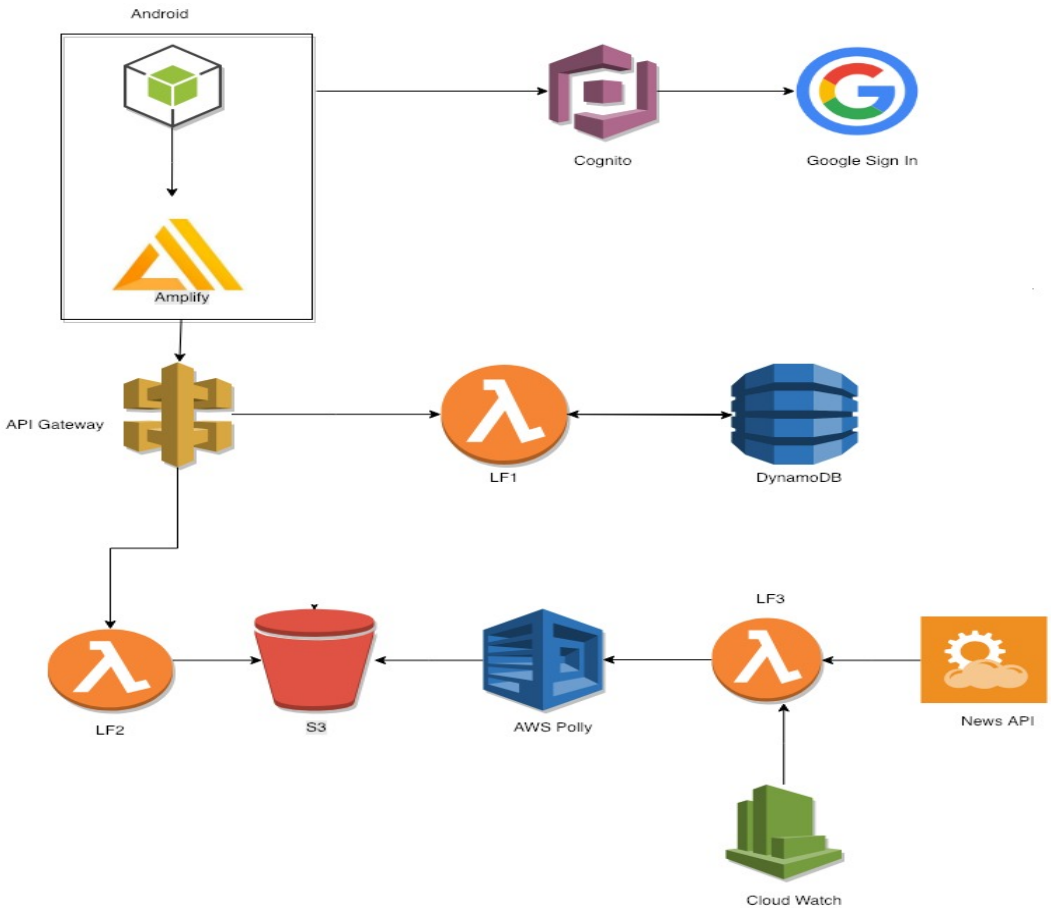

Fig. 1 Architecture diagram of the application

The above is the architecture of our web application bike-n-roll. Here the user can sign in through Cognito - Google federated identity. We maintain our bikes and user's database in DynamoDB, and all the processing is done through lambda functions. Our backend and frontend are connected through API Gateway. The daily news we fetch from news API is converted from text to speech using AWS Polly service. We use AWS CloudWatch to fetch the latest news which is stored in S3 This converted mp3 format file is stored in the S3 bucket and our android application can access the file from S3 bucket using API Gateway and Lambda function. We have also used AWS SageMaker for analyzing the Citi Bike Dataset so that we can find the locations in the New York city which are in demand for bike rental. Thus, we use these locations to place our bike.

AMAZON WEB SERVICES USED:

- AWS Amplify
- AWS Cognito - Google Federated Identity
- AWS API Gateway
- AWS Lambda
- AWS Polly
- AWS DynamoDB
- AWS S3
- AWS SageMaker
- AWS CloudWatch

VISUALIZATIONS:

We analyzed the Citi bike dataset to understand the most in-demand bike rental locations. The dataset available if from January - June 2016.

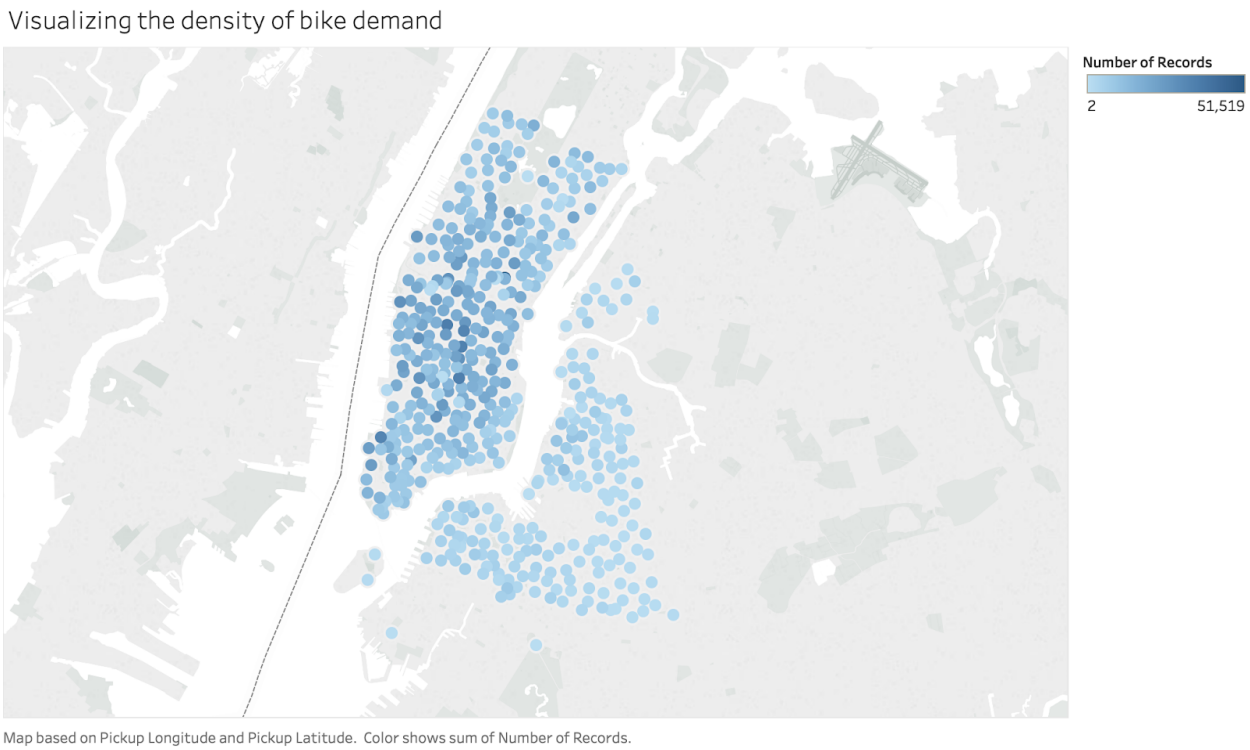

Fig. 2 Visualization of the density of most in-demand bikes in the city

The visualization shows the density of bike demand across the city. We can observe heat map for the demand mostly around midtown.

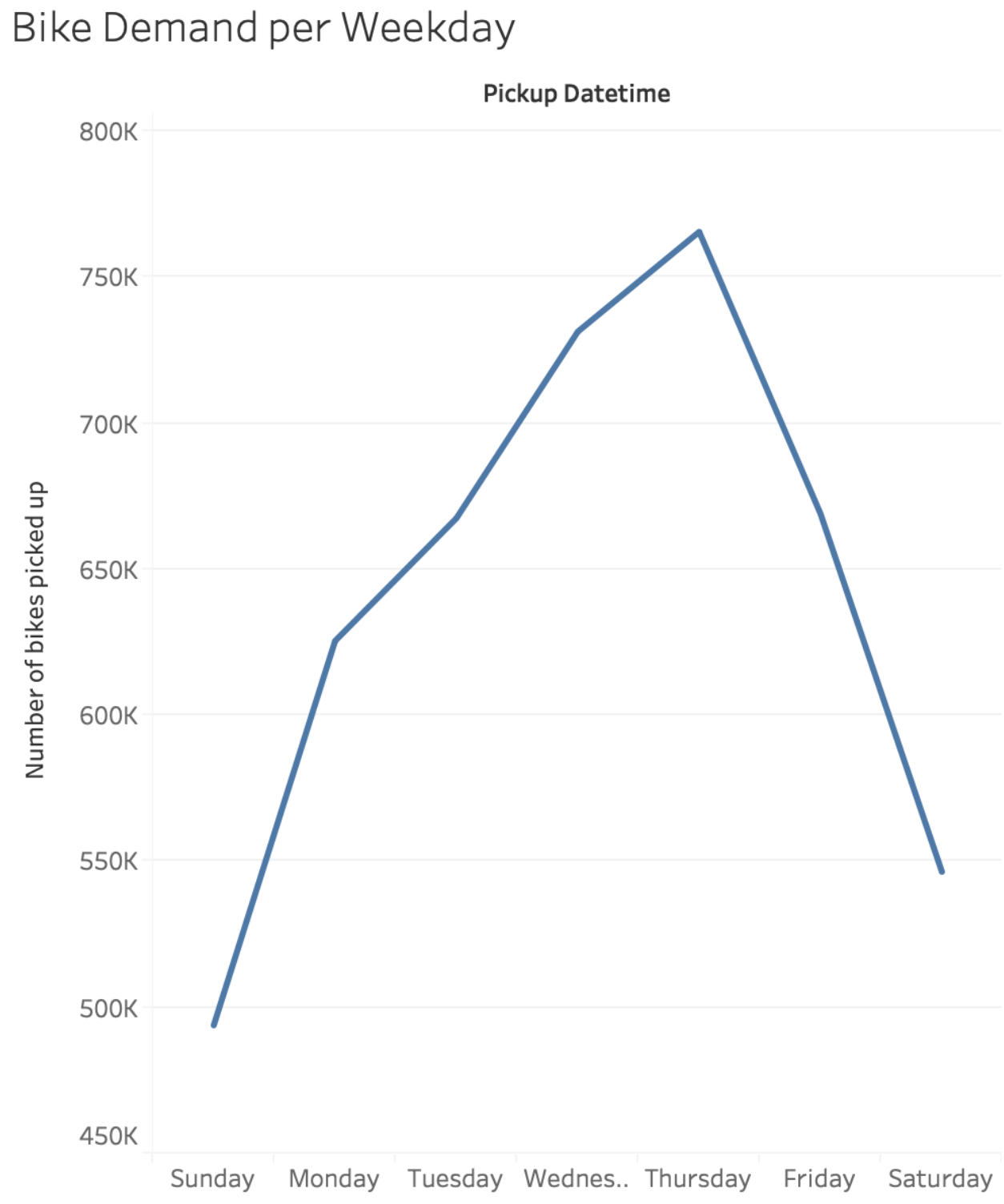

Fig. 3 Line chart showing the demands of bike each day

This graph shows the demand for the bikes over the weekdays. Contradictorily as supposed to our intuition, we observe that the demand on the weekends is quite less as compared to the weekdays.

REFERENCES:

- https://aws-amplify.github.io/docs/android/start
- https://docs.aws.amazon.com/index.html#lang/en_us
- https://developers.google.com/maps/documentation/
- https://developer.android.com/docs/
- https://www.kaggle.com/roundedup/new-york-citi-bike-trip-duration

GITHUB LINK:

https://github.com/Sneha2302/BikeNRoll

YOUTUBE LINK:

https://youtu.be/aymF0eXxJQ8