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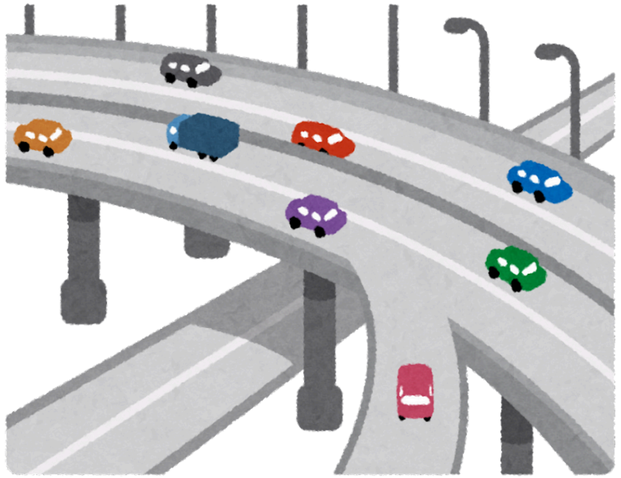
FINAL PROJECT

AI1801 - DAP391m- Instructor: HoangTN



Group 3

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Nguyễn Thị Bích Tuyền
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Đinh Văn Anh Khôi
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Nguyễn Phạm Thiên Phú

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CONTENTS

Introducing data

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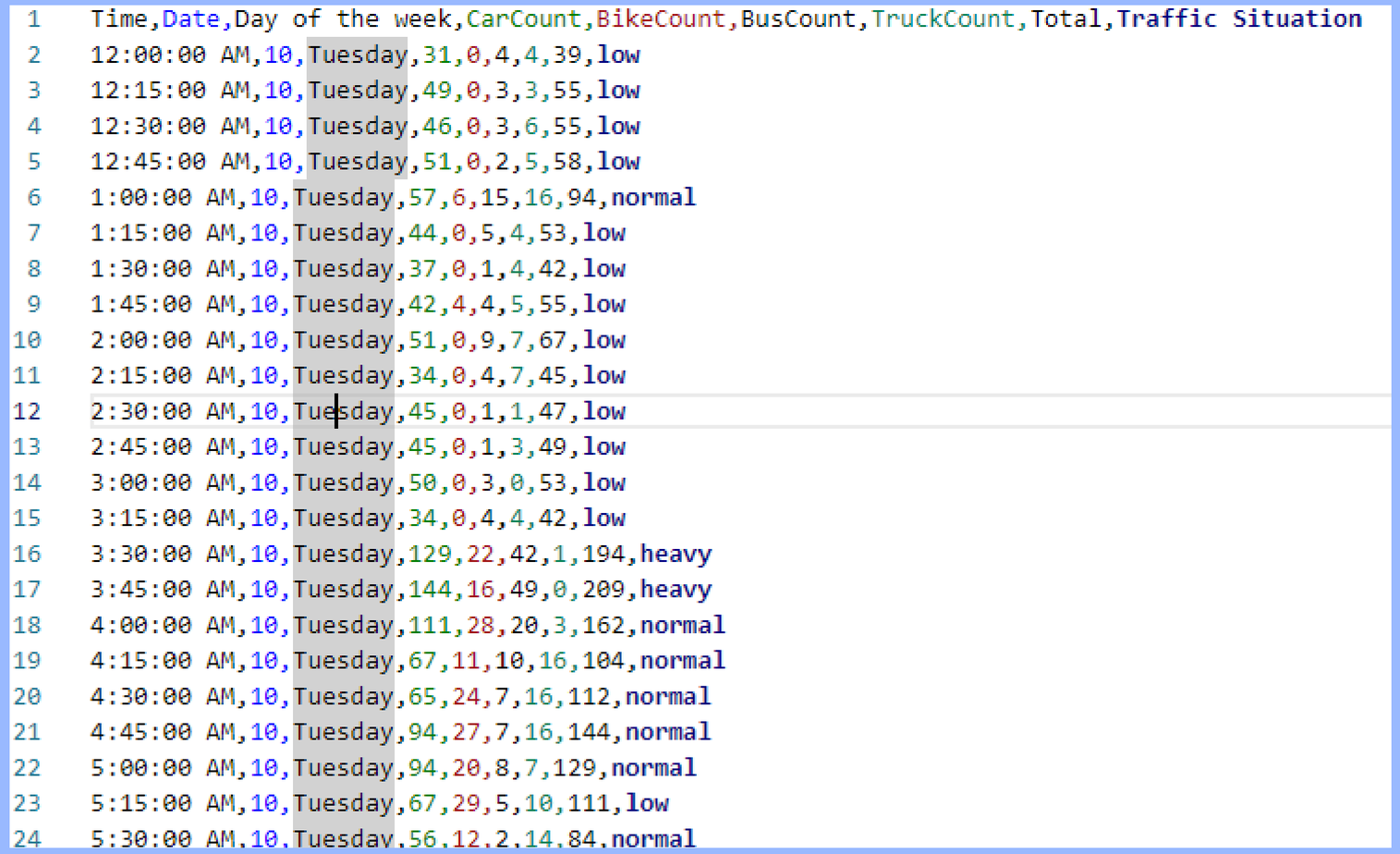
Traffic Dataset Overview:

Description: Collected by a computer vision model that detects four vehicle types (cars, bikes, buses, trucks). Stored in CSV format with data on time, date, day of the week, and vehicle count.

Key fields: CarCount, BikeCount, BusCount, TruckCount, Total (all vehicles every 15 minutes), and Traffic Status (1-Heavy, 2-High, 3-Normal, 4-Low).



```
Time,Date,Day of the week,CarCount,BikeCount,BusCount,TruckCount,Total,Traffic Situation
12:00:00 AM,10,Tuesday,31,0,4,4,39,low
12:15:00 AM,10,Tuesday,49,0,3,3,55,low
12:30:00 AM,10,Tuesday,46,0,3,6,55,low
12:45:00 AM,10,Tuesday,51,0,2,5,58,low
1:00:00 AM,10,Tuesday,57,6,15,16,94,normal
1:15:00 AM,10,Tuesday,44,0,5,4,53,low
1:30:00 AM,10,Tuesday,37,0,1,4,42,low
1:45:00 AM,10,Tuesday,42,4,4,5,55,low
2:00:00 AM,10,Tuesday,51,0,9,7,67,low
2:15:00 AM,10,Tuesday,34,0,4,7,45,low
2:30:00 AM,10,Tuesday,45,0,1,1,47,low
2:45:00 AM,10,Tuesday,45,0,1,3,49,low
3:00:00 AM,10,Tuesday,50,0,3,0,53,low
3:15:00 AM,10,Tuesday,34,0,4,4,42,low
3:30:00 AM,10,Tuesday,129,22,42,1,194,heavy
3:45:00 AM,10,Tuesday,144,16,49,0,209,heavy
4:00:00 AM,10,Tuesday,111,28,20,3,162,normal
4:15:00 AM,10,Tuesday,67,11,10,16,104,normal
4:30:00 AM,10,Tuesday,65,24,7,16,112,normal
4:45:00 AM,10,Tuesday,94,27,7,16,144,normal
5:00:00 AM,10,Tuesday,94,20,8,7,129,normal
5:15:00 AM,10,Tuesday,67,29,5,10,111,low
5:30:00 AM,10,Tuesday,56,12,2,14,84,normal
```

Introducing data

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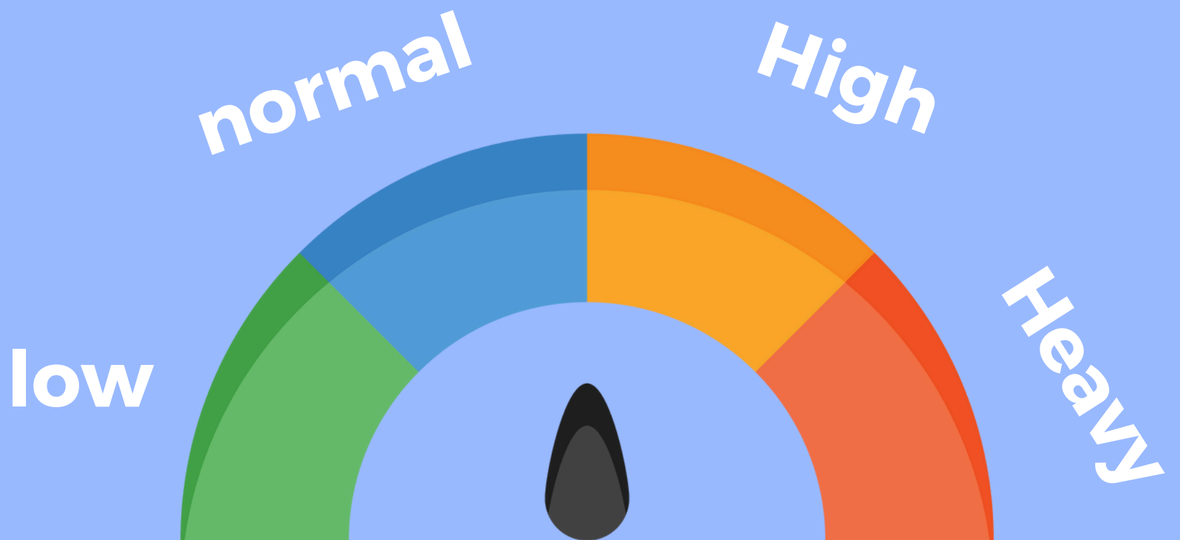
Use cases:

Traffic planning: Analyze traffic patterns, manage congestion, optimize signals, and adjust lanes.

Urban planning: Assess the impact of traffic on infrastructure, zoning, and congestion mitigation decisions.

Traffic Study: Study hourly, daily, and daily patterns and explore correlations with external factors for better traffic flow insights.

=> in this project we use to predict traffic levels



Data Visualization

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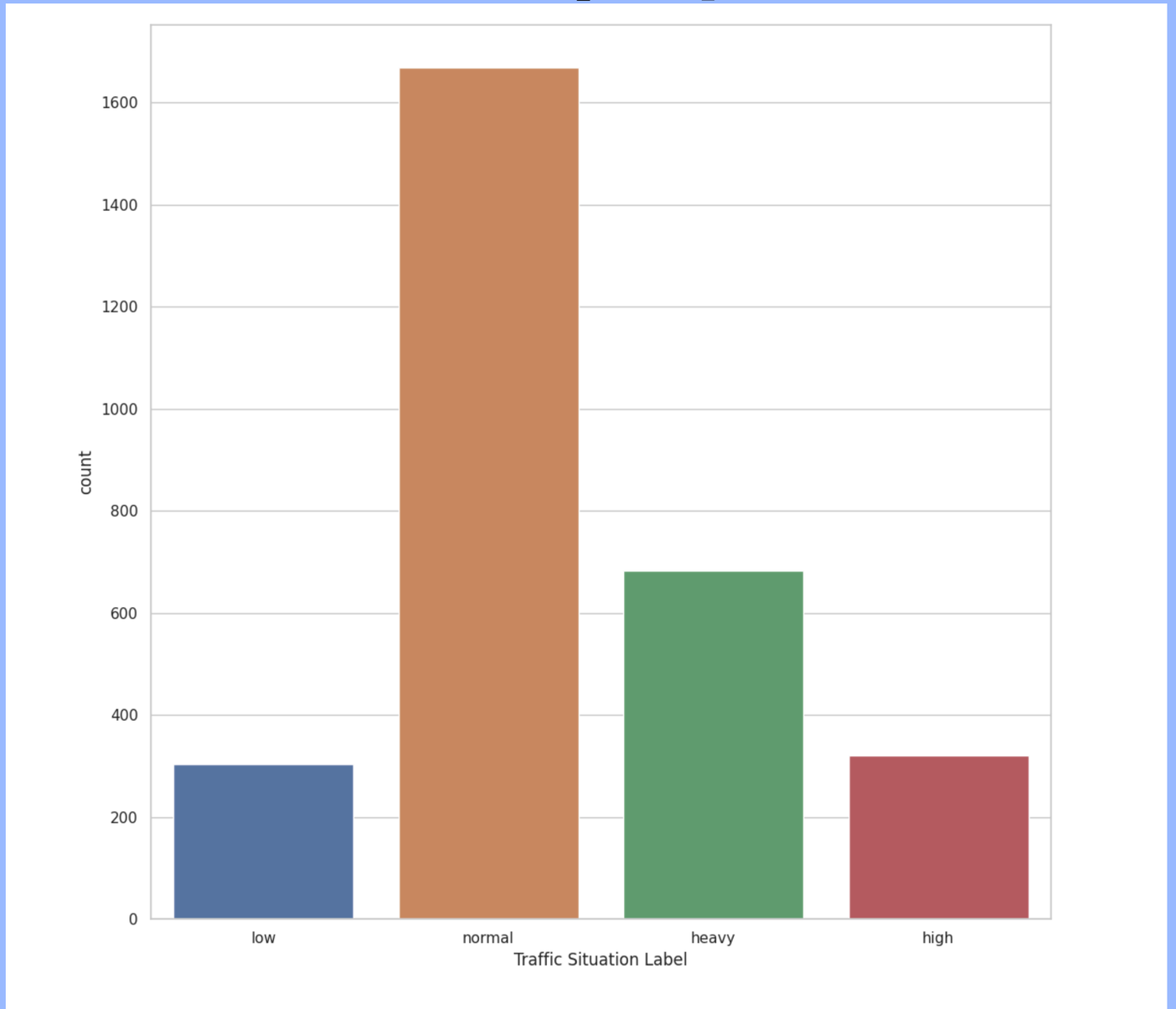
traffic frequency



Data Visualization

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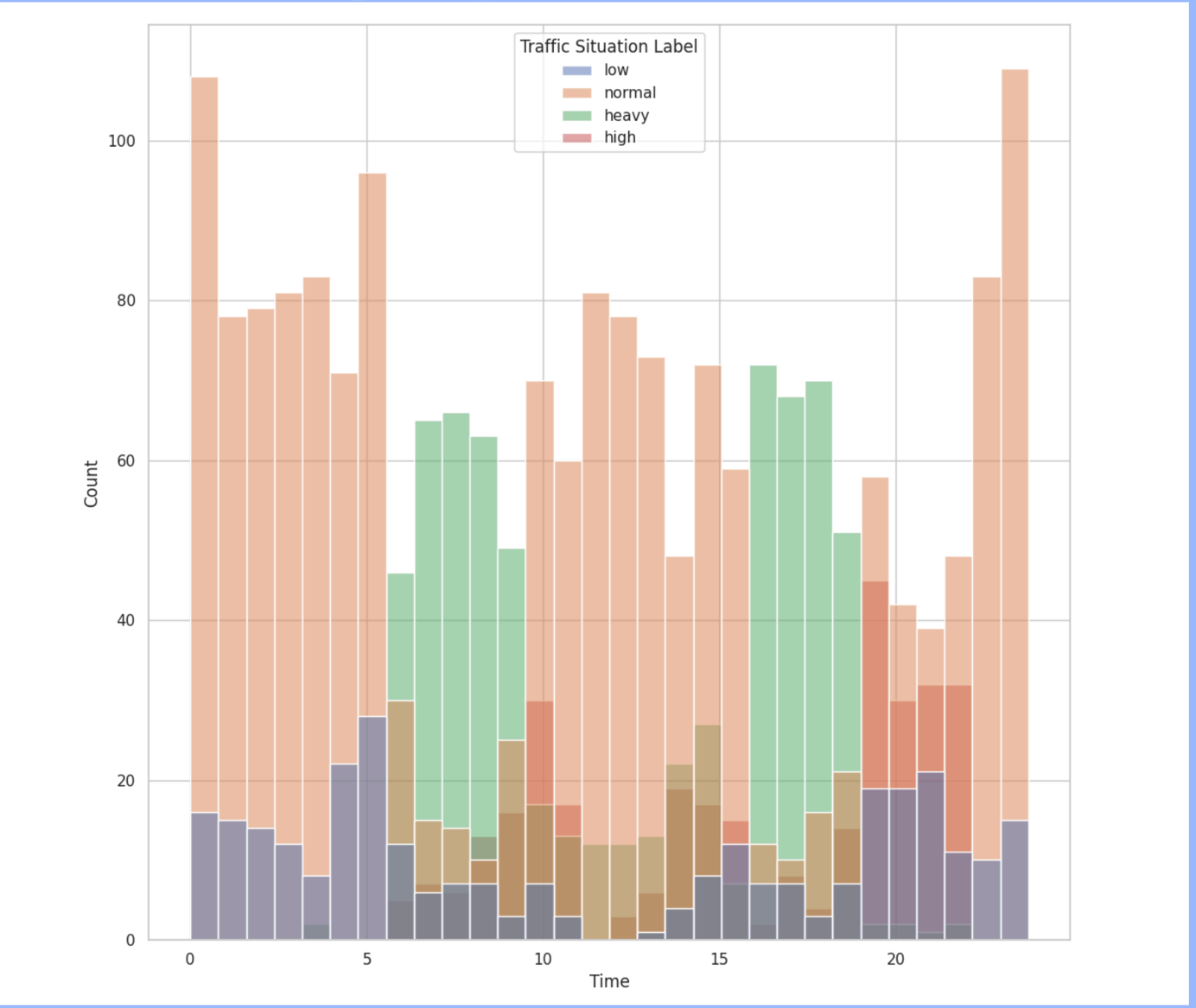
traffic time and frequency



Data Visualization

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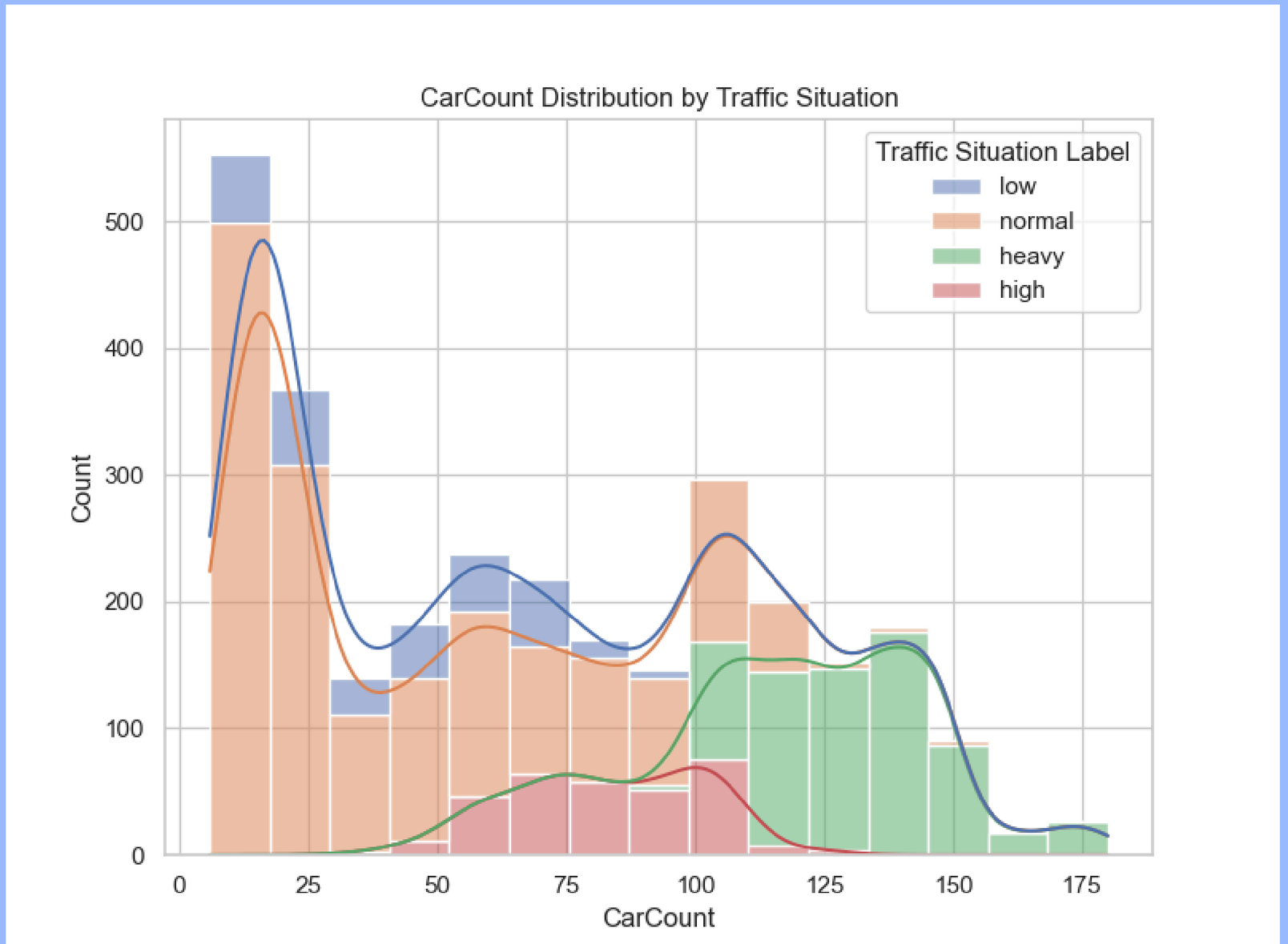
vehicle traffic



Data Visualization

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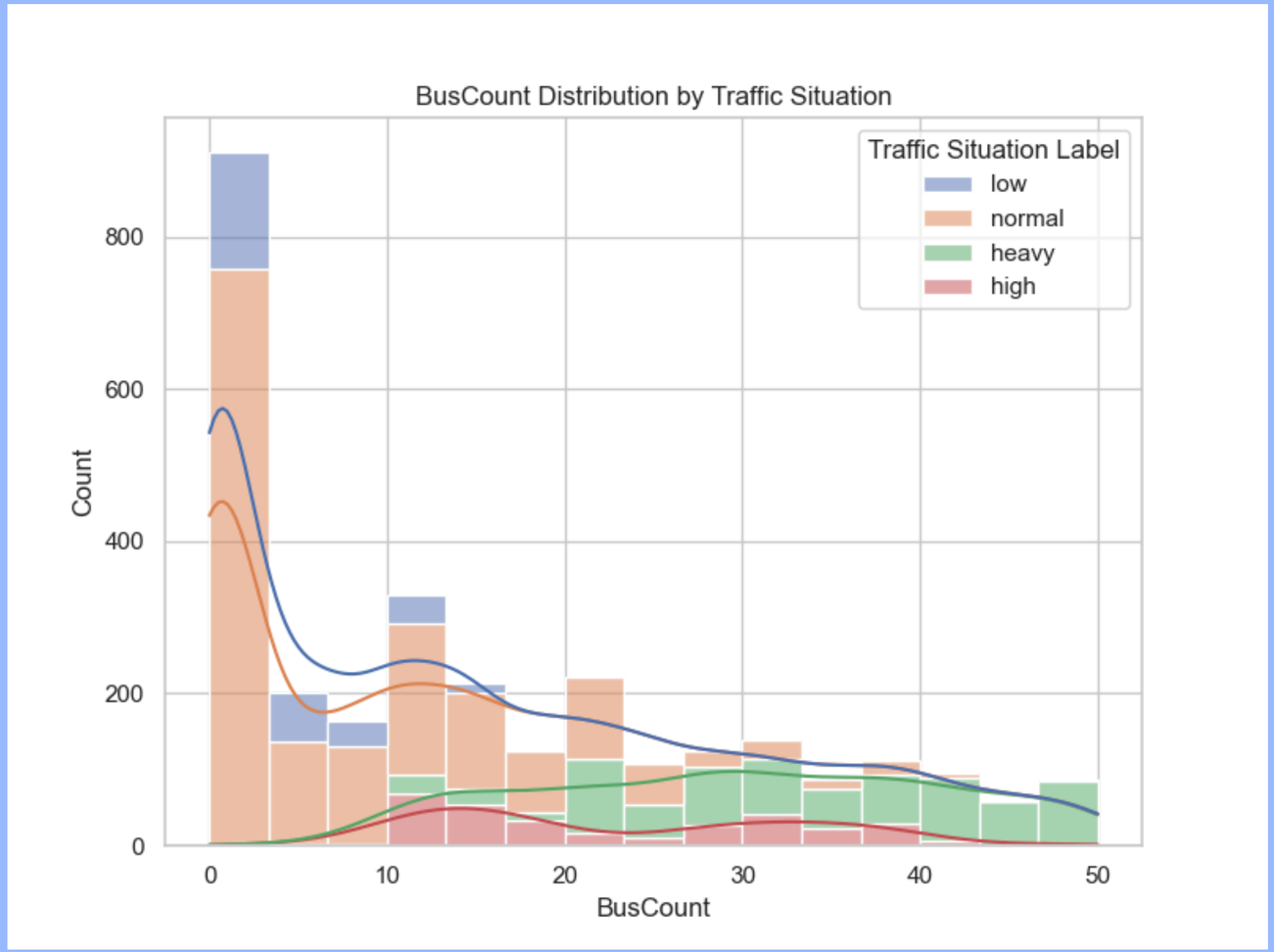
vehicle traffic



vehicle traffic

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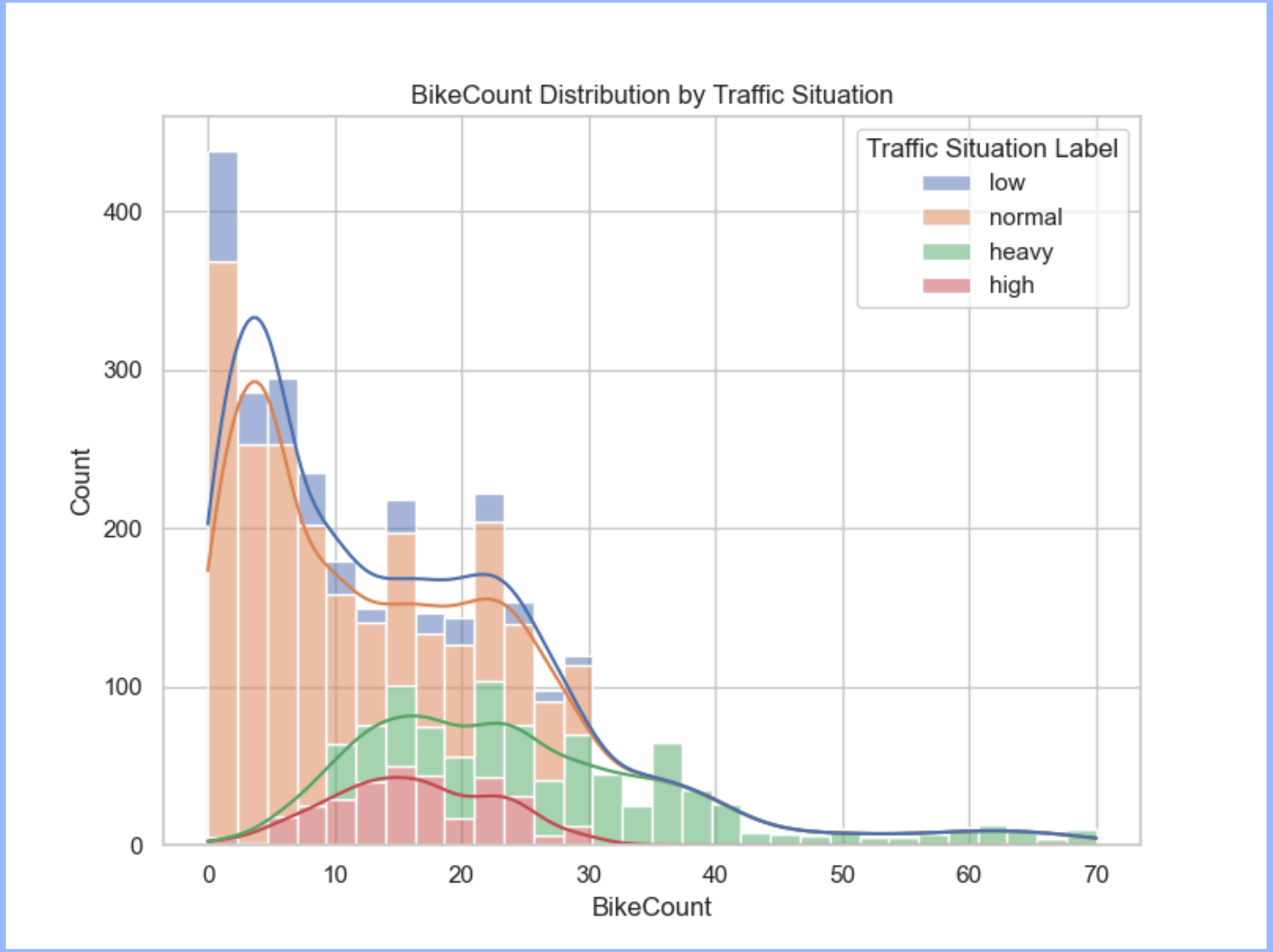

vehicle traffic

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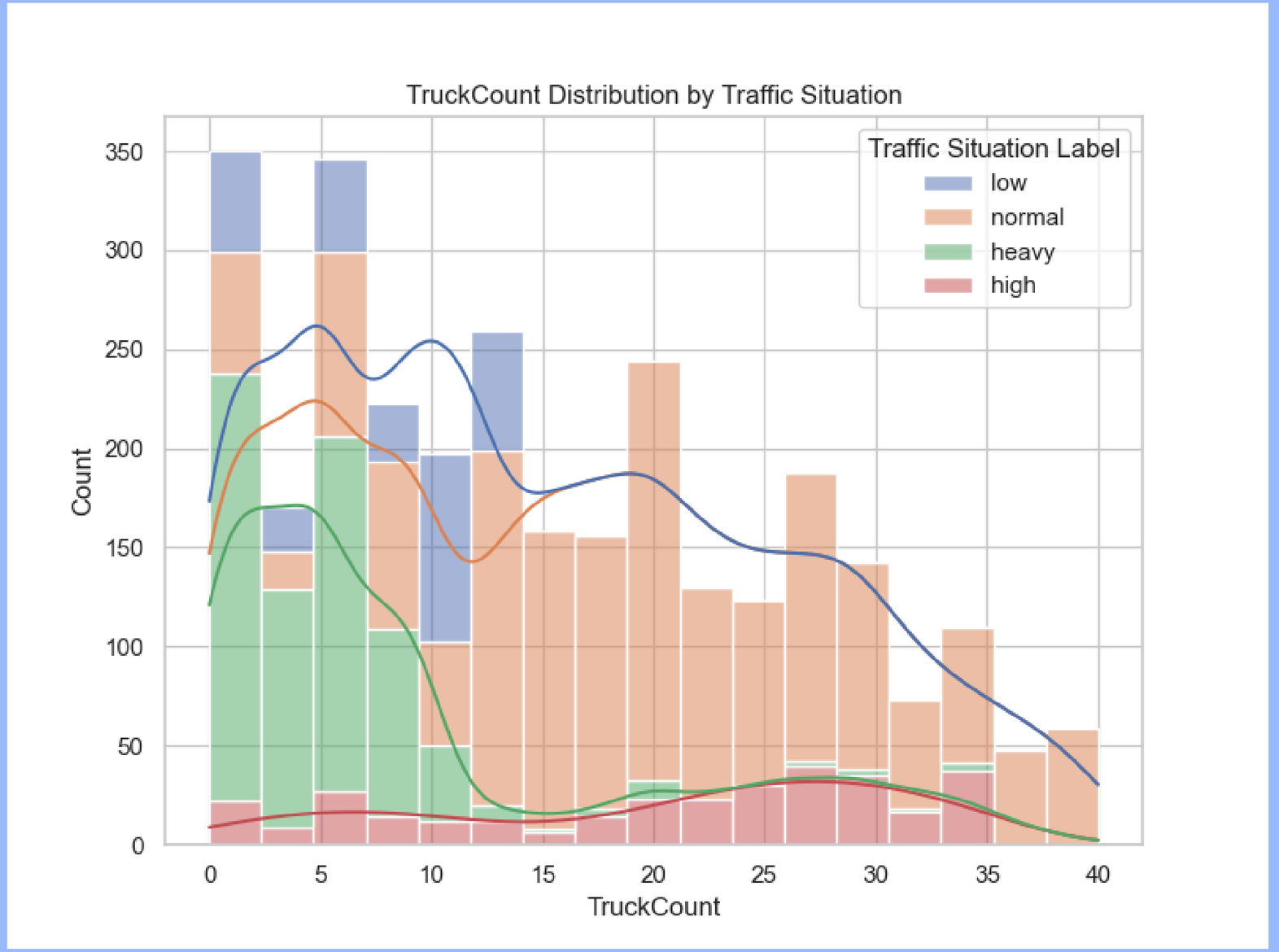

Models used in the program

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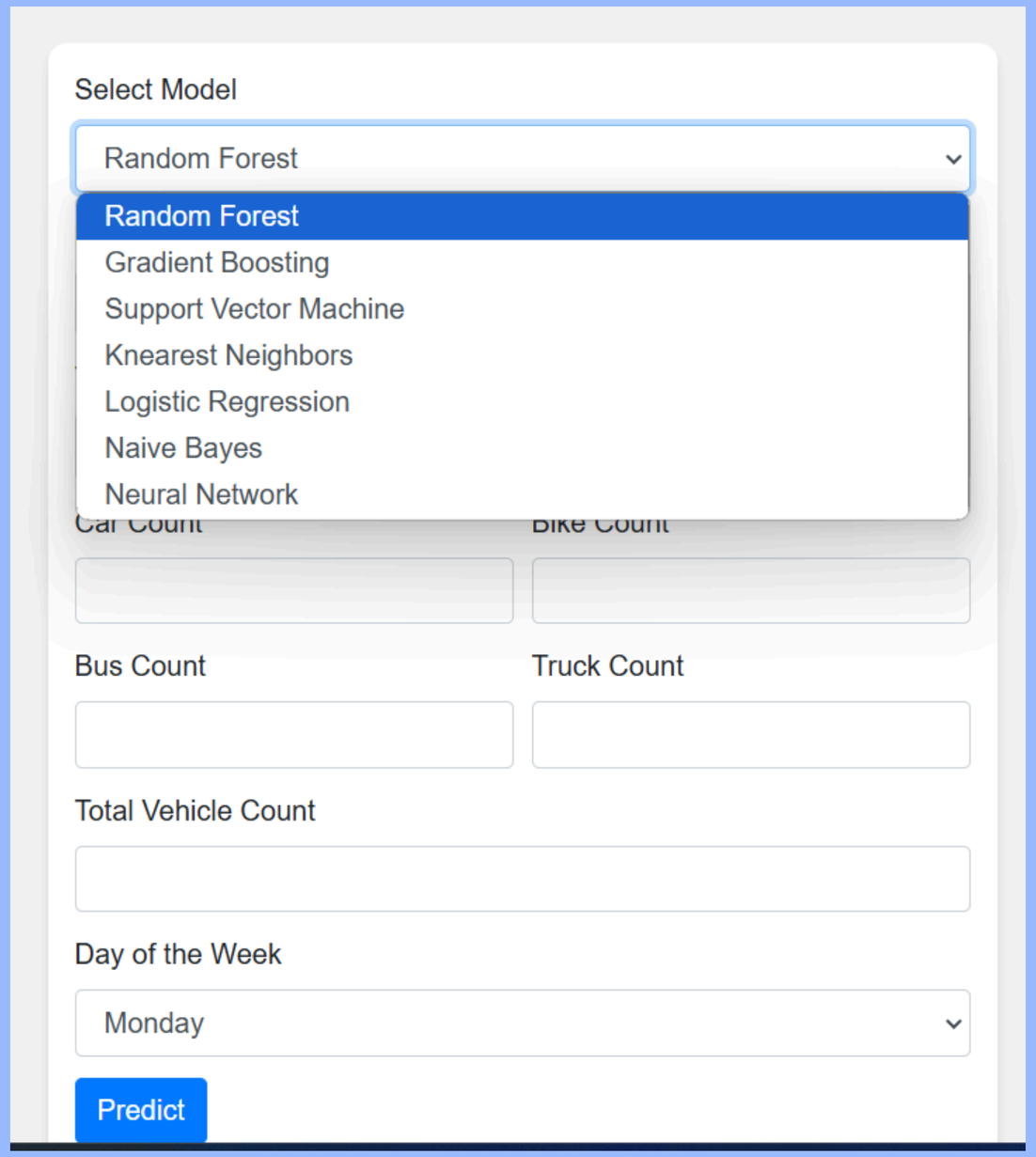
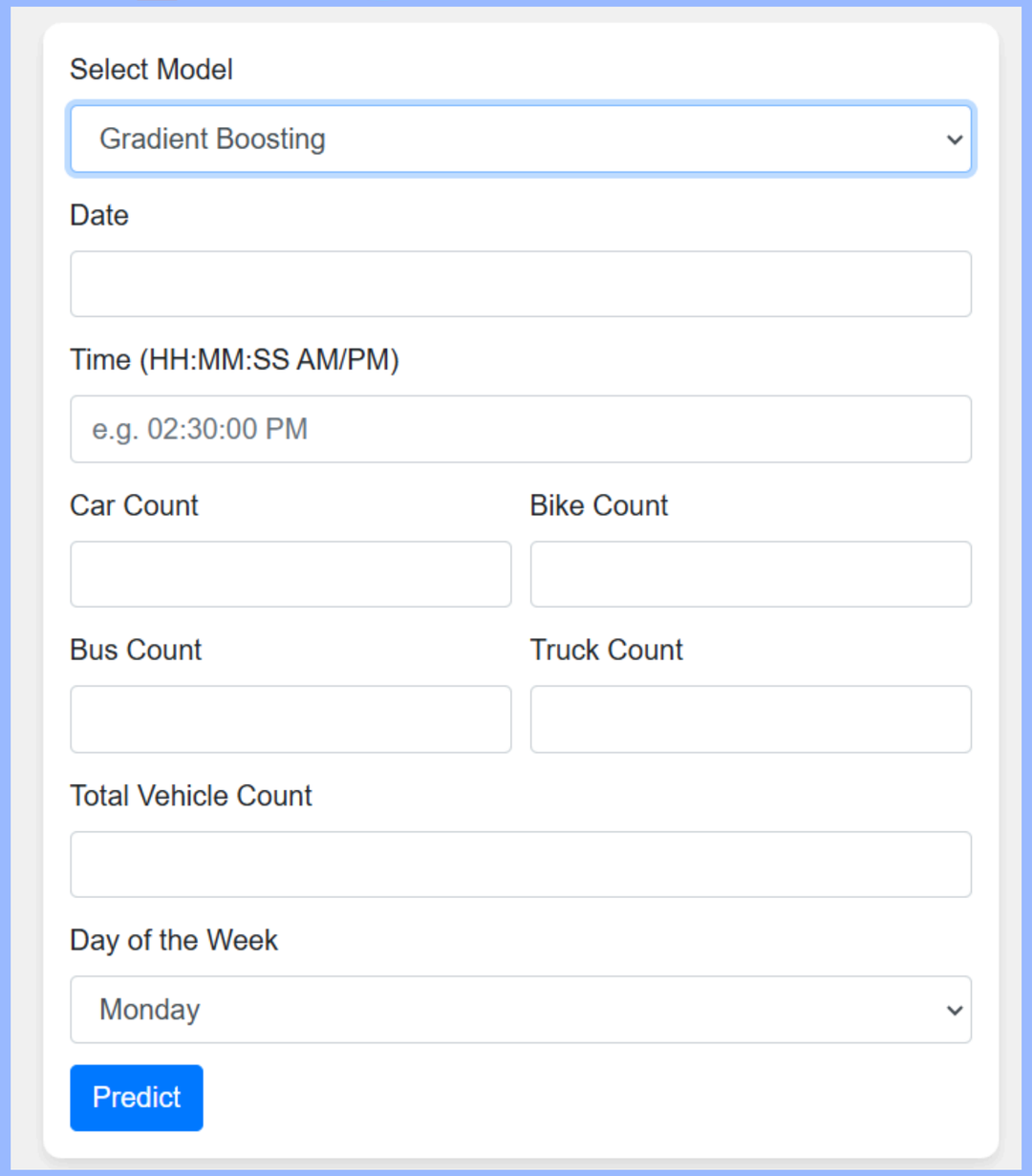
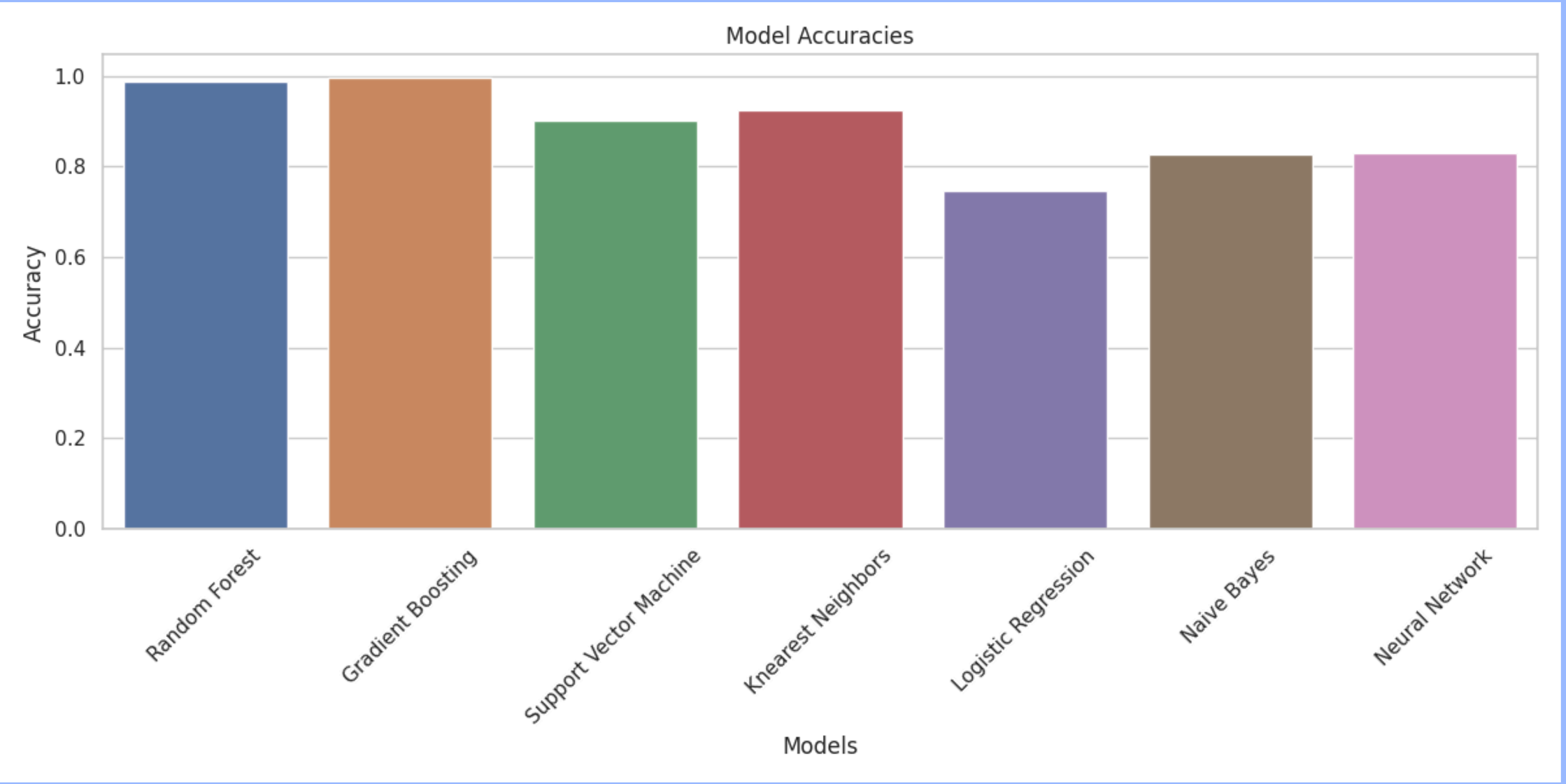




accuracy


Model Accuracies
Accuracy
1.0
0.8
0.6
0.4
0.2
0.0
Random Forest
Gradient Boosting
Support Vector Machine
Knearest Neighbors
Logistic Regression
Naive Bayes
Neural Network
Models

Deployment with AWS - Docker

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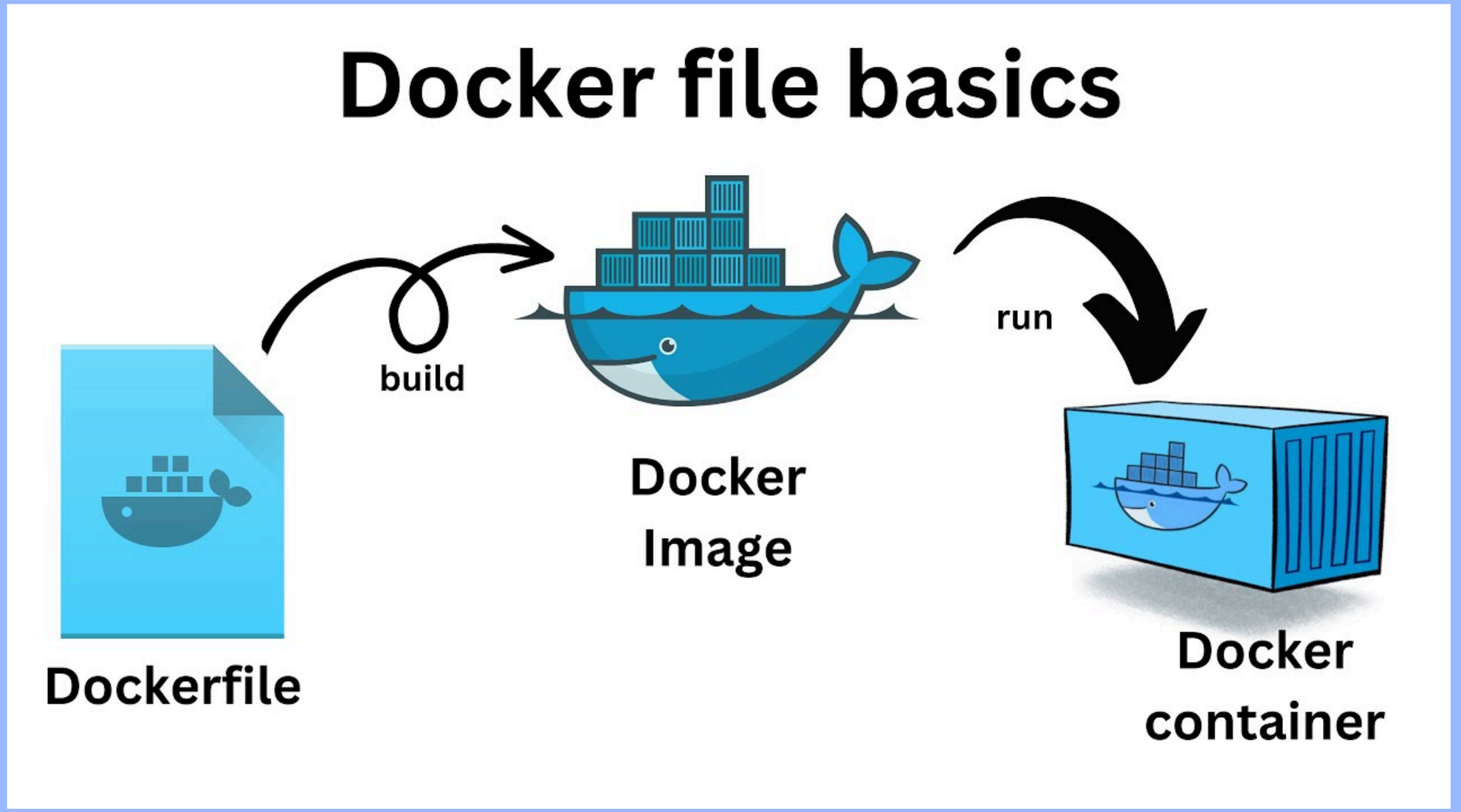

ECR

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Push commands for huy-ecr

macOS / Linux | Windows

Make sure that you have the latest version of the AWS CLI and Docker installed. For more information, see Getting Started with Amazon ECR.

Use the following steps to authenticate and push an image to your repository. For additional registry authentication methods, including the Amazon ECR credential helper, see Registry Authentication.

1. Retrieve an authentication token and authenticate your Docker client to your registry. Use the AWS CLI:

```
aws ecr get-login-password --region ap-southeast-1 | docker login --username AWS --password-stdin 354918392038.dkr.ecr.ap-southeast-1.amazonaws.com
```

Note: If you receive an error using the AWS CLI, make sure that you have the latest version of the AWS CLI and Docker installed.

2. Build your Docker image using the following command. For information on building a Docker file from scratch see the instructions here. You can skip this step if your image is already built:

```
docker build -t huy-ecr .
```

3. After the build completes, tag your image so you can push the image to this repository:

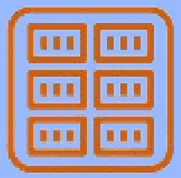
```
docker tag huy-ecr:latest 354918392038.dkr.ecr.ap-southeast-1.amazonaws.com/huy-ecr:latest
```

4. Run the following command to push this image to your newly created AWS repository:

```
docker push 354918392038.dkr.ecr.ap-southeast-1.amazonaws.com/huy-ecr:latest
```

Close

Amazon Elastic Container Registry (Amazon ECR)



Registry

Image

aws

ELASTIC CONTAINER | ECR

ECR

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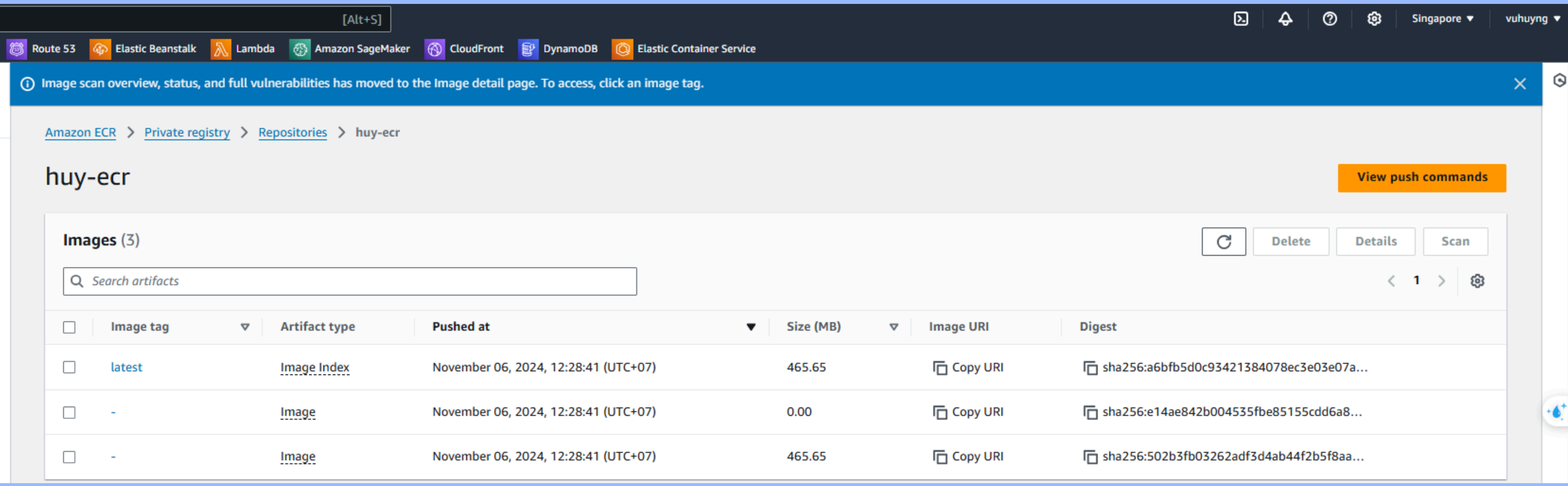

aws

ECS

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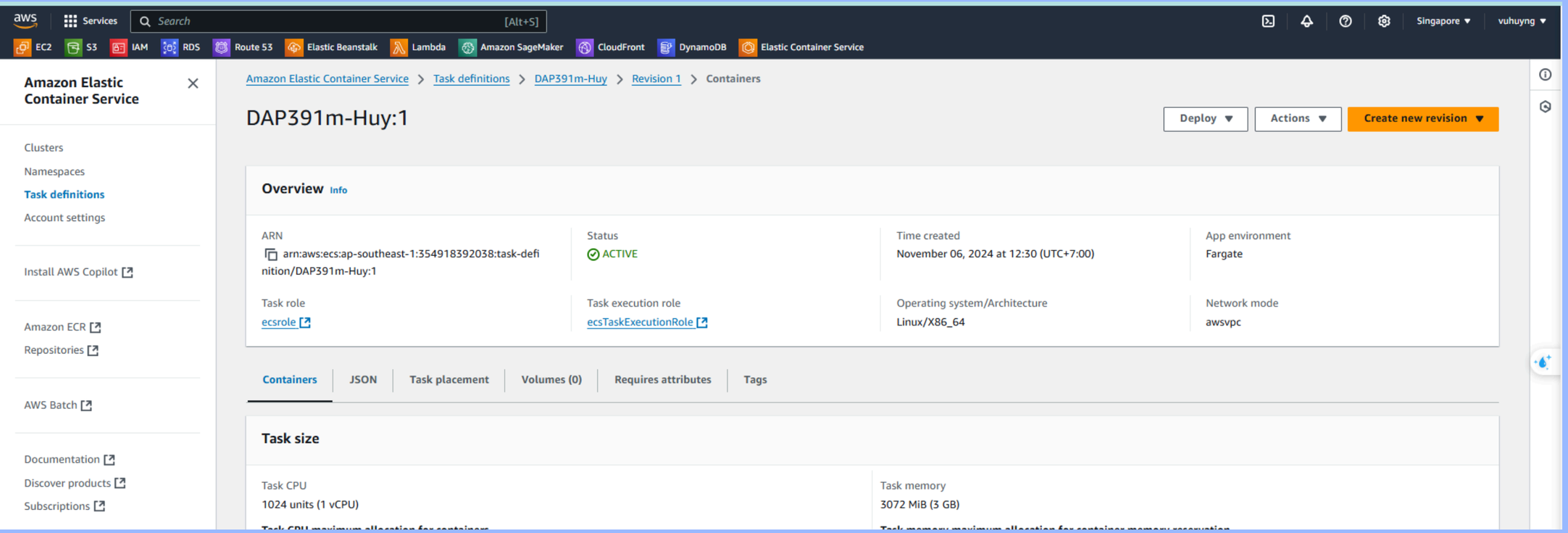
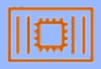


Amazon Elastic Container Service (Amazon ECS)

Container 1



Container 2

Container 3

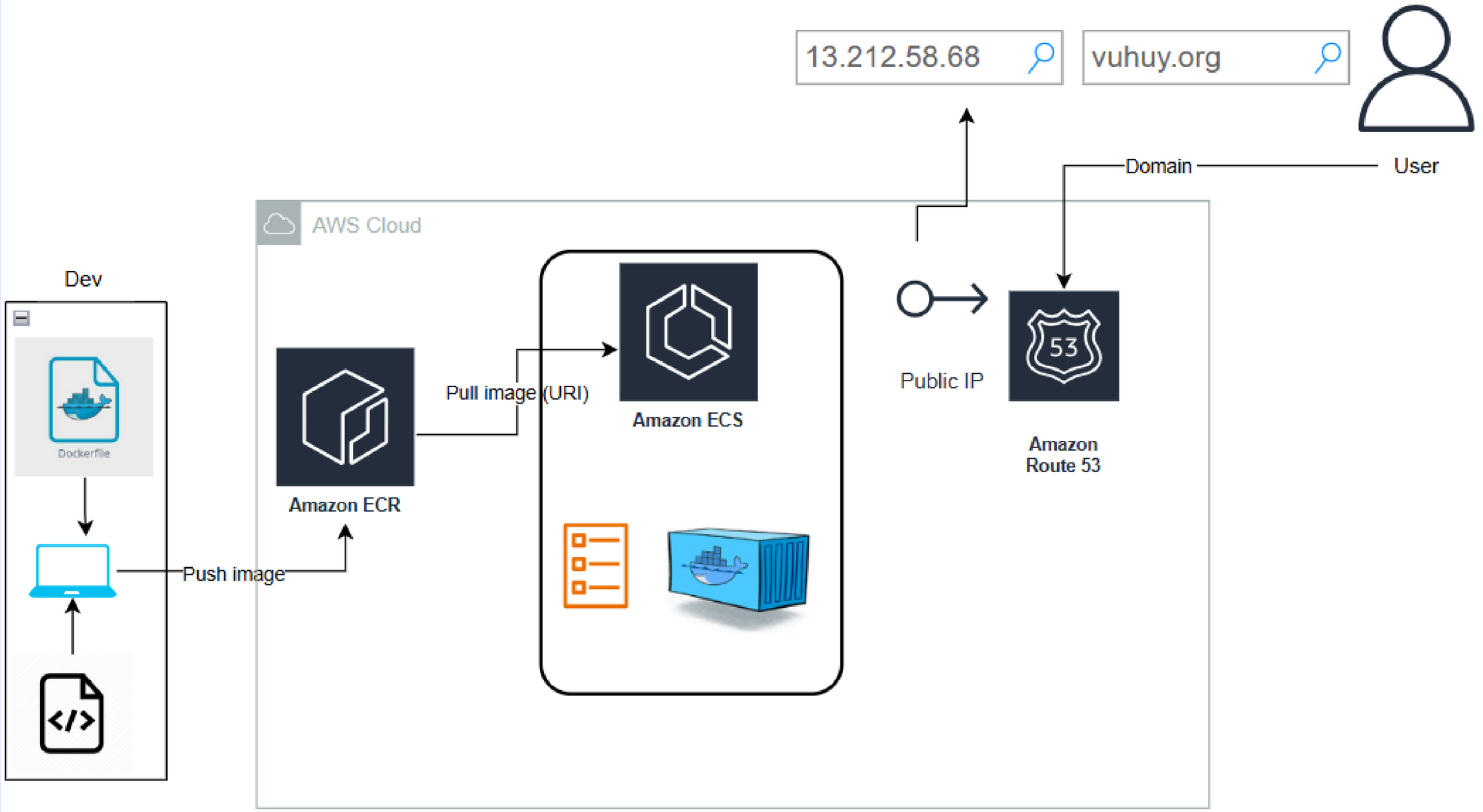
Task

Service

ECS Service Connect

aws

System diagram



DEMO

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Name: Nguyen Vu Huy
Student ID: CE180834

Traffic Prediction Application

Select Model

Random Forest

Date

Time (HH:MM:SS AM/PM)

e.g. 02:30:00 PM

Car Count

Bike Count

Bus Count

Truck Count

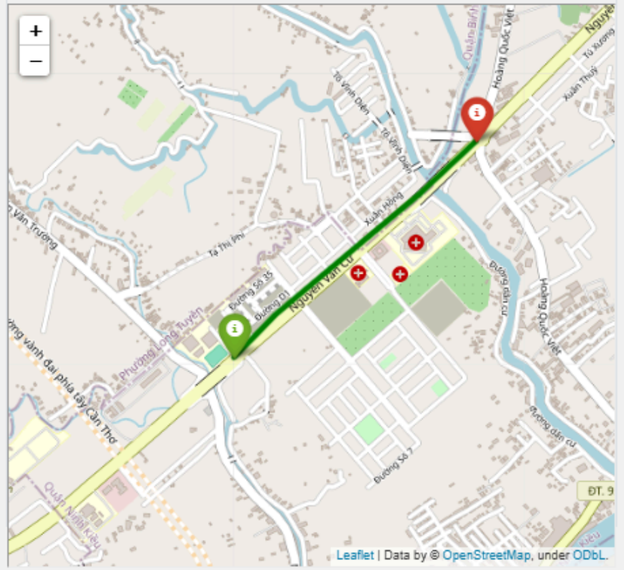
Total Vehicle Count

Day of the Week

Monday

Predict

Traffic Map



Model Accuracies

Traffic Situation Distribution

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