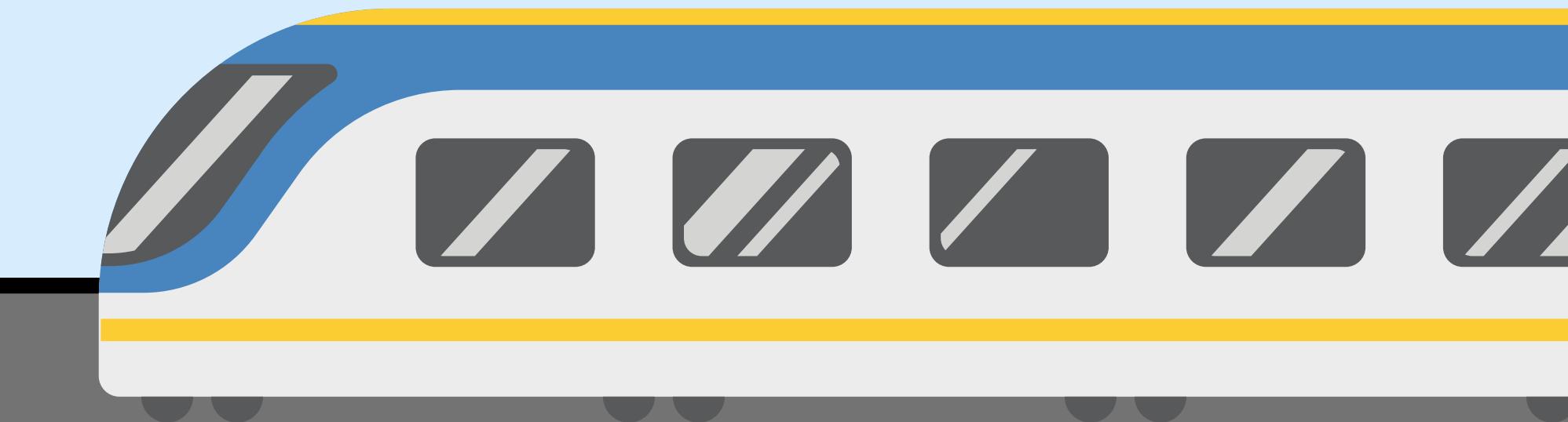
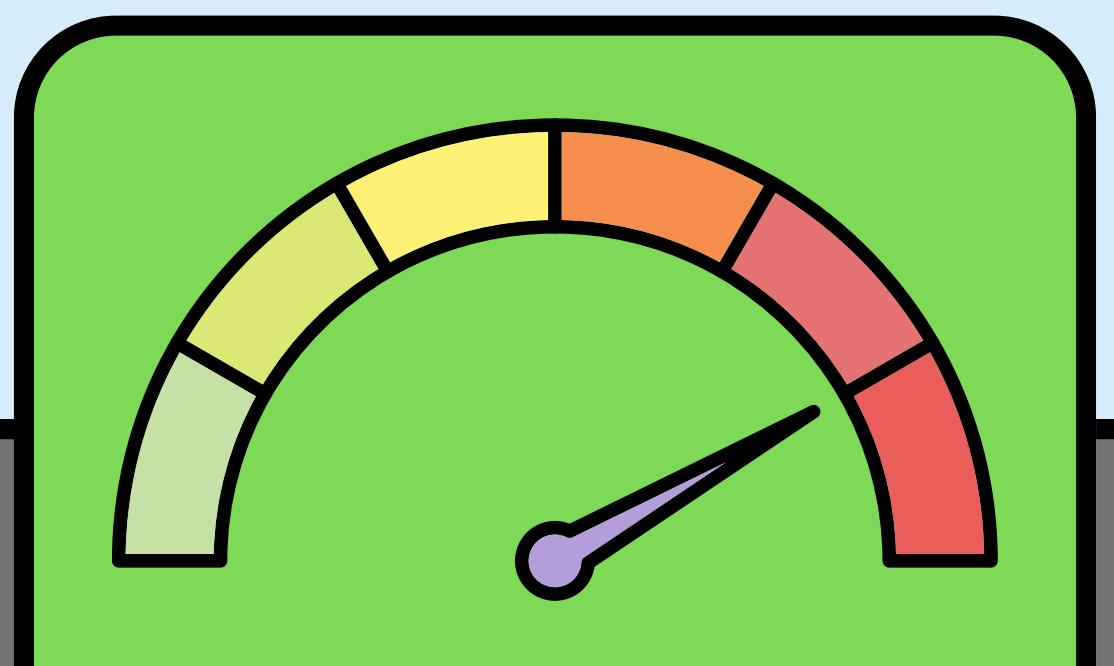
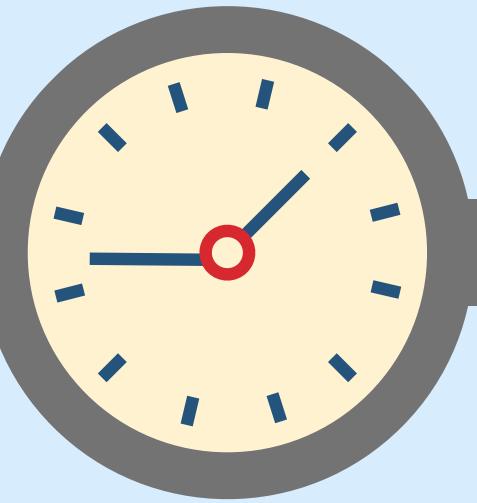




Weather x Metro line (MetroModel)



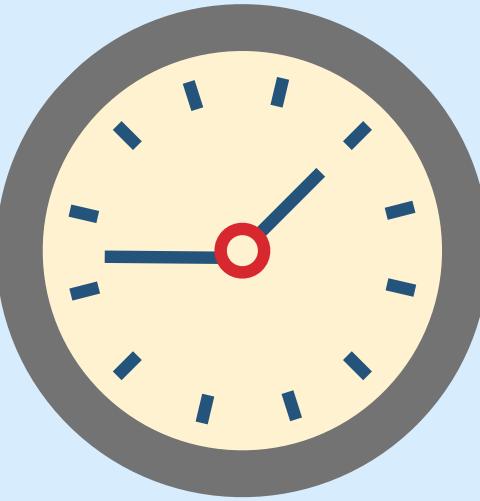
Members



Thanawas Sirilertsathit 6610545308

Sorasit Kateratorn 6610545944

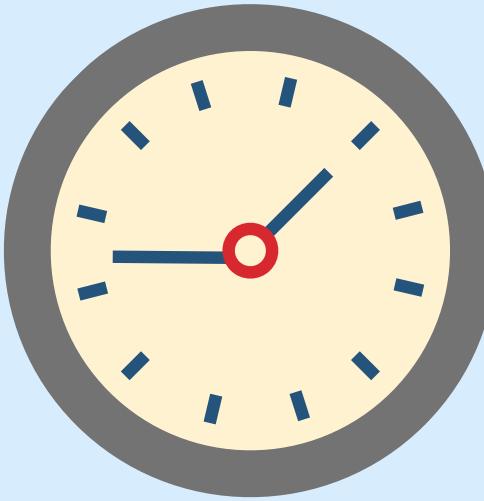
Background



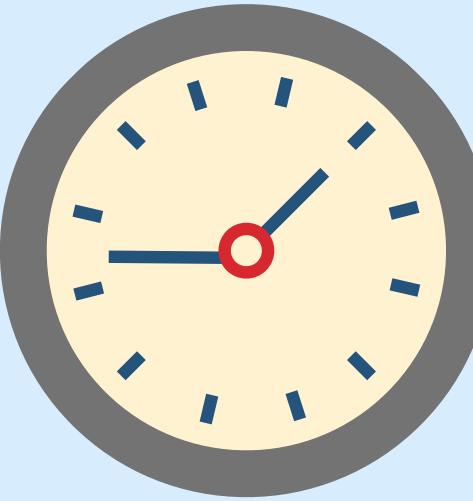
Bangkok's metro system is a critical part of daily transportation, with millions relying on it every day.

Motivation

Unpredictable crowding in Bangkok's metro lines affects commuters daily. Our goal is to predict passenger congestion using weather and historical data, helping commuters plan smarter and improve transit efficiency.

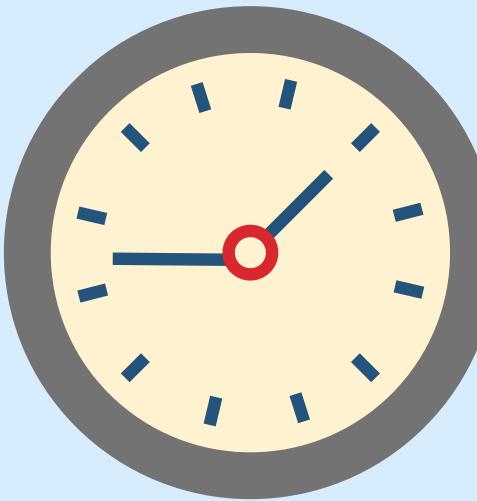


What is MetroModel?

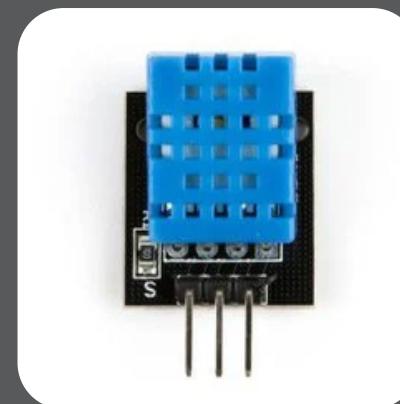


- A web application for decision making about travelling using the train lines inside Bangkok.
- This web app will predict the number of passengers in each hour upto now using sensor data.

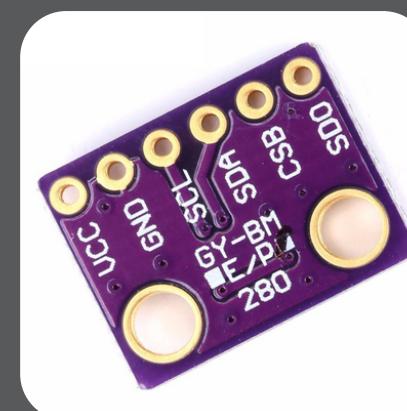
Data sources



Primary Data



DHT11



BMP280

Secondary Data



Historical
weather data



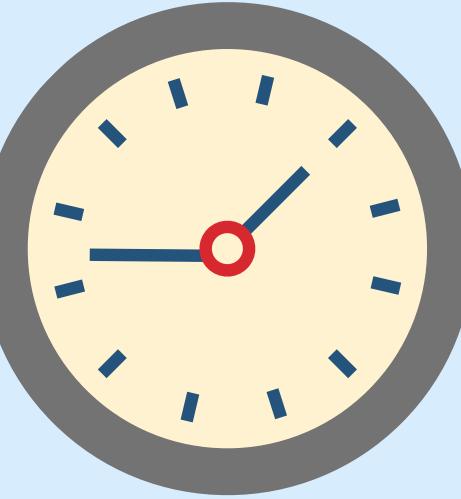
Passenger Record
from 2021-2025

Primary Data Source



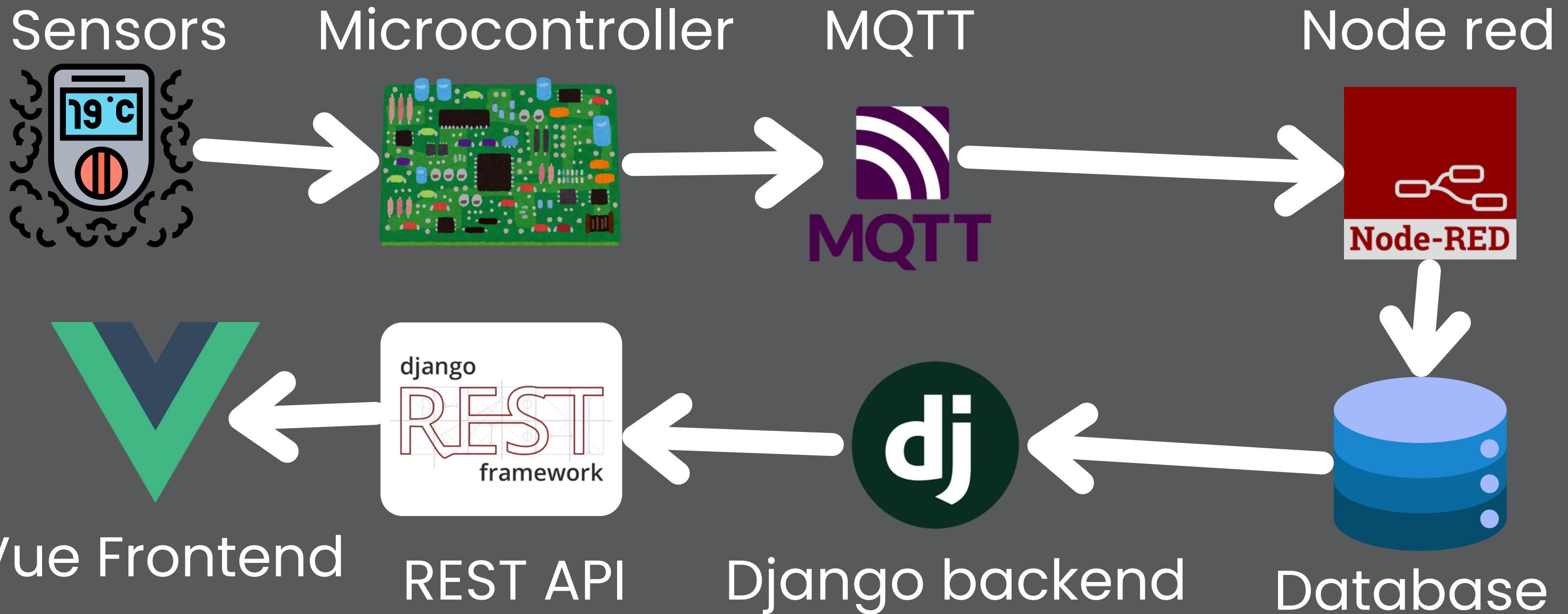
- BMP280 sensors were deployed to measure real-time temperature and air pressure.
- DHT11 sensors were used to collect humidity data.
- Multiple sensors were placed in different locations(my house and my friend's house)

Secondary Data Source

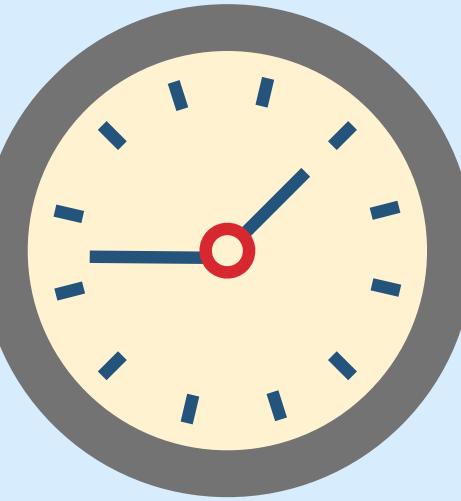


- Passenger count data was obtained from the Ministry of Transportation to train and validate our models.
- Historical weather data was gathered through a Bangkok weather API, used for getting data from 2021 up to March 15th (before we set up the sensors) use to train model and provide the data in early March.

Data Collection Methods

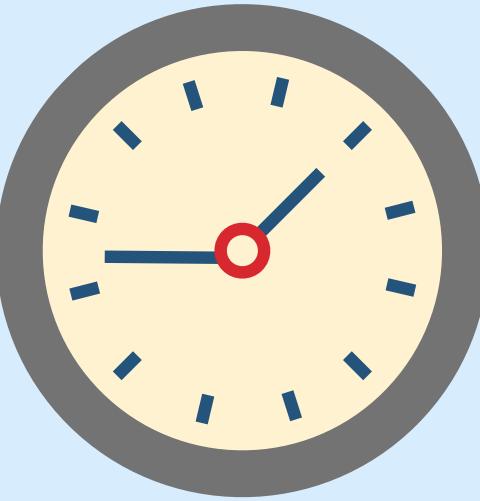


How we predict?

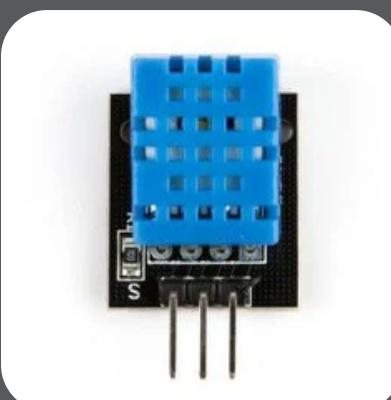


- Receive Train line, Time (Hour), Temperature, Humidity, Air Pressure and Day as inputs
- Process by Naive Bayes then use Naive Bayes result in Quantile Regression

Tech Stack



Data



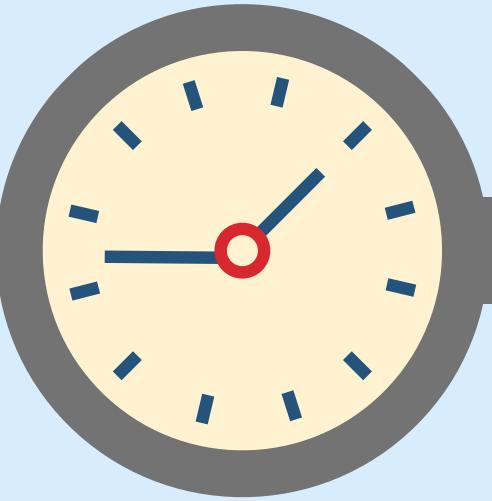
Backend



Frontend



Database Schema

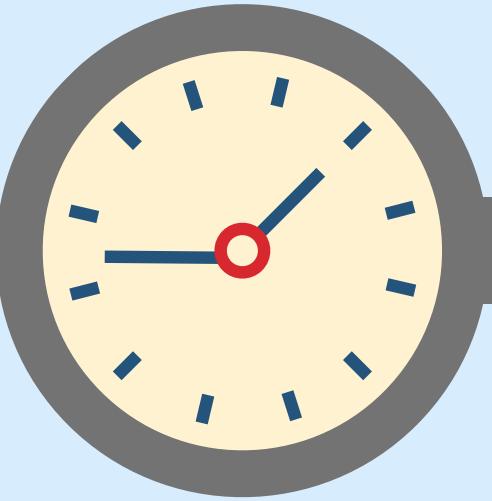


Project table original in php database

- id: primary key auto increment (int)
- ts: current timestamp (timestamp)
- lat: latitude (float)
- lon: longitude (float)
- temperature: measure in celcius unit (float)
- pressure: measure in millibar unit (float)
- humidity: 0 - 100% (float)



Database Schema

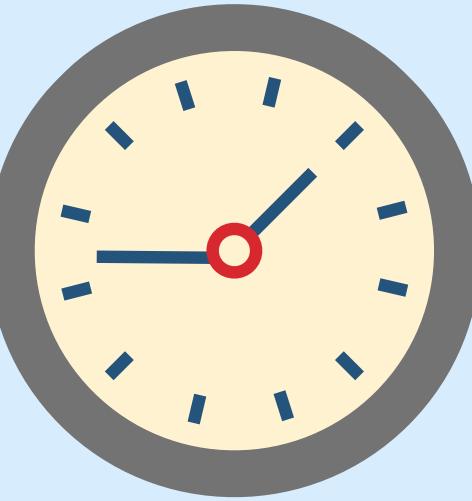


Project table integration for ShortHourly schema

- hour: Time which interval is 1 hour always end at hh:00 (timestamp)
- lat: latitude (float)
- lon: longitude (float)
- temperature: measure in celcius unit (float)
- pressure: measure in millibar unit (float)
- humidity: 0 - 100% (float)



Database Schema



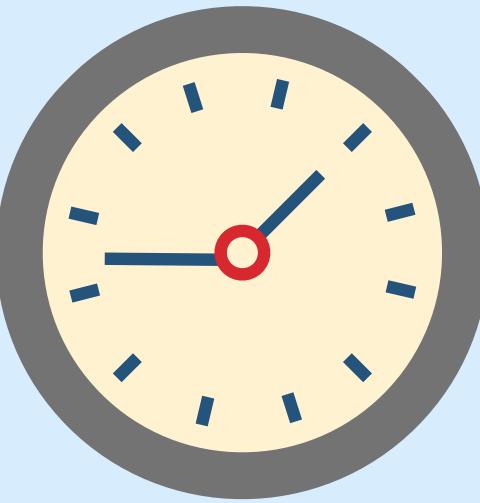
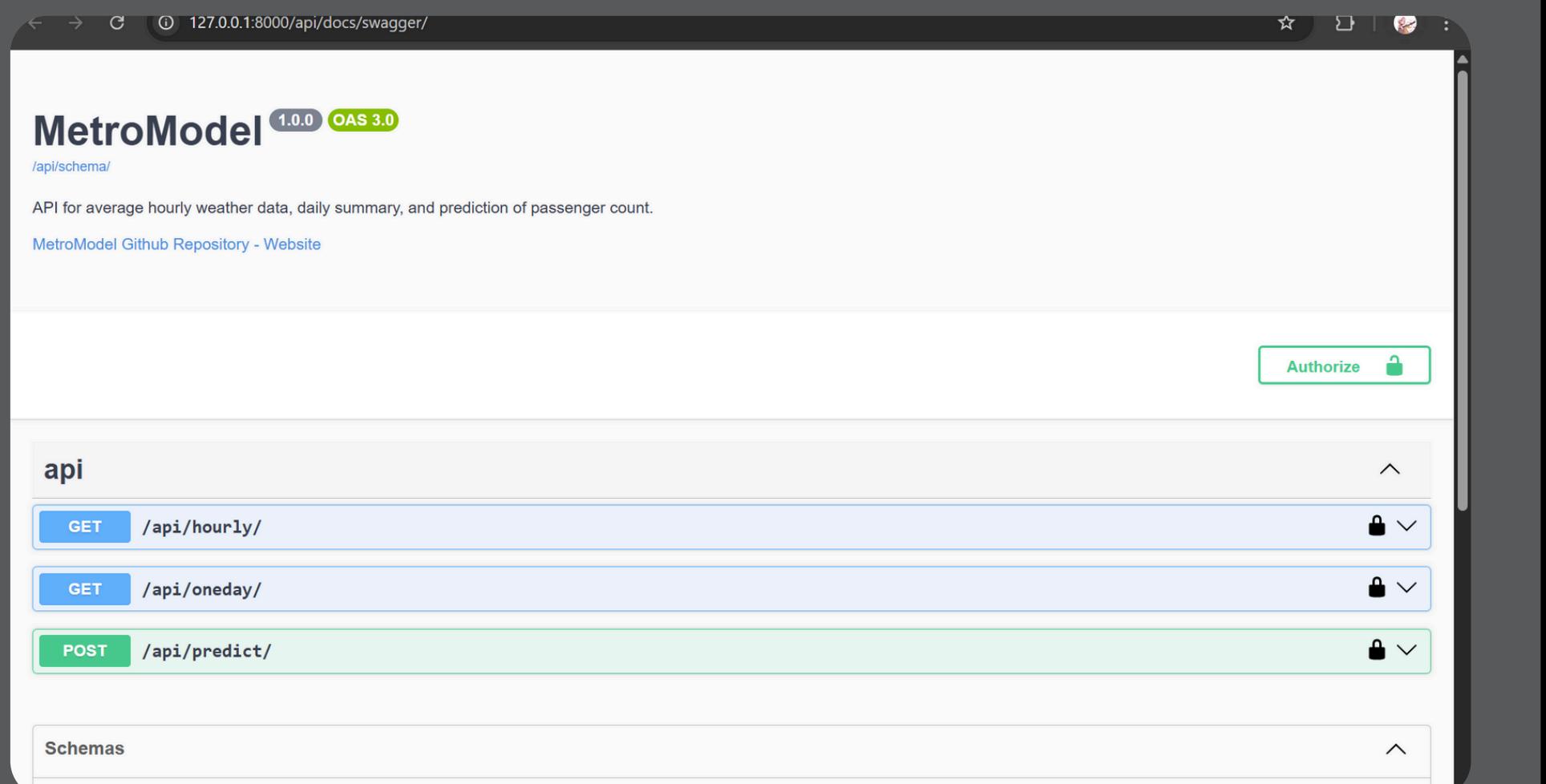
Project table integration for OneDayResult schema

- Passenger_Rating: Prediction result to determine density of passenger (string)
- Passenger_Count: Prediction result for number of passengers (int)
- Hour: Time in hour (int)
- Time_Block: Morning, Afternoon, Evening or Night (string)
- Day_of_Week: Sunday, Monday, ... (string)
- temperature_c: Temperature in celcius unit (float)
- humidity: humidity in percentage unit (float)
- pressure_mb: pressure in millibar unit (float)

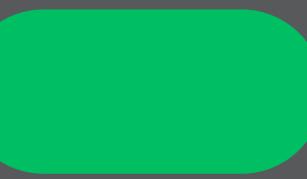
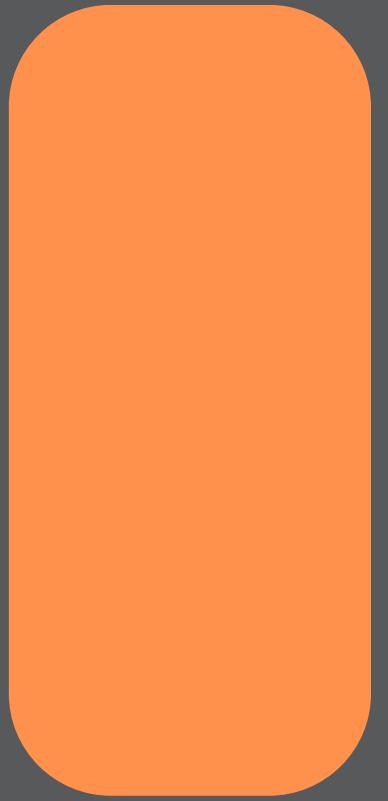
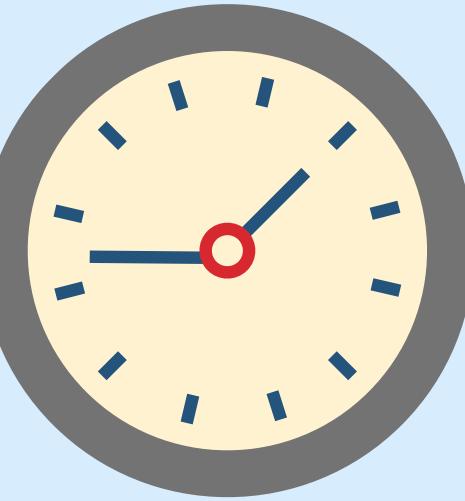


Data sharing API

- /api/hourly to get all data in the database
- /api/oneday to get data in one day with query parameters for day and train line key
- /api/predict to predict the passenger with manually input data



Passenger Rating



Very Low | Low | Moderate | Crowded | Dense | Very Dense



Demo Time !





For more info

<https://github.com/Thanawas-Sirilertsathit/MetroModel.git>