

Individual Project Report

Team Name: AI Predictors

Project Title: Intelligent Dengue Predictor



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1. My personal contribution to this project.

Prediction Model Preparation and Validation which including:

- Dengue cases collection from NEA website

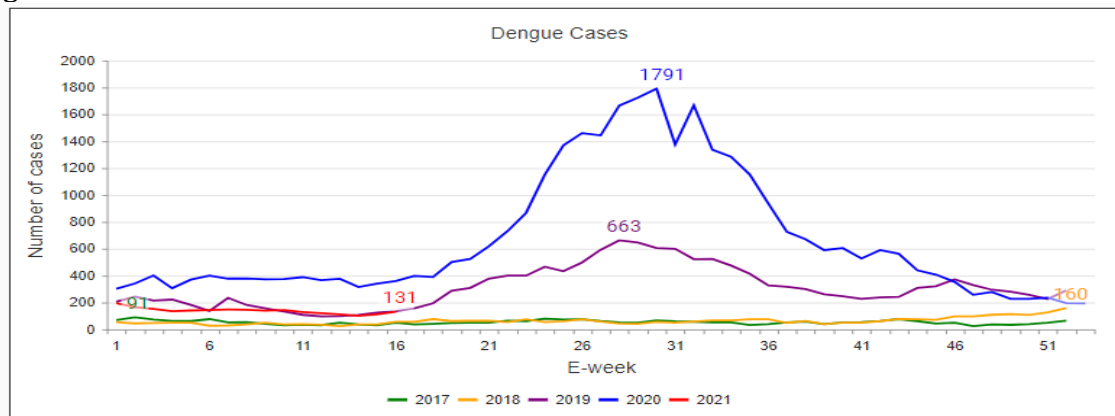


Figure 1: Dengue Cases from NEA Website

Number of Reported Cases

24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr at 3pm
17	8	16	18	7	9	11

Number of Reported Cases by E-week (from Sun 0000hrs to Sat 2359hrs)

E-week 11 (14-20Mar21)	E-week 12 (21-27Mar21)	E-week 13 (28Mar-03Apr21)	E-week 14 (04-10Apr21)	E-week 15 (11-17Apr21)	E-week 16 (18-24Apr21)	E-week 17 (25-30Apr21 at 3pm)
129	120	113	102	112	131	69

Table 1: Daily/ Weekly Dengue Cases from NEA Website

- Weather data collection from Data.gov.sg Realtime Weather Data across Singapore API
- Data pre-processing & Feature Engineering. Adding moving average on weather data, as shown in below figure.

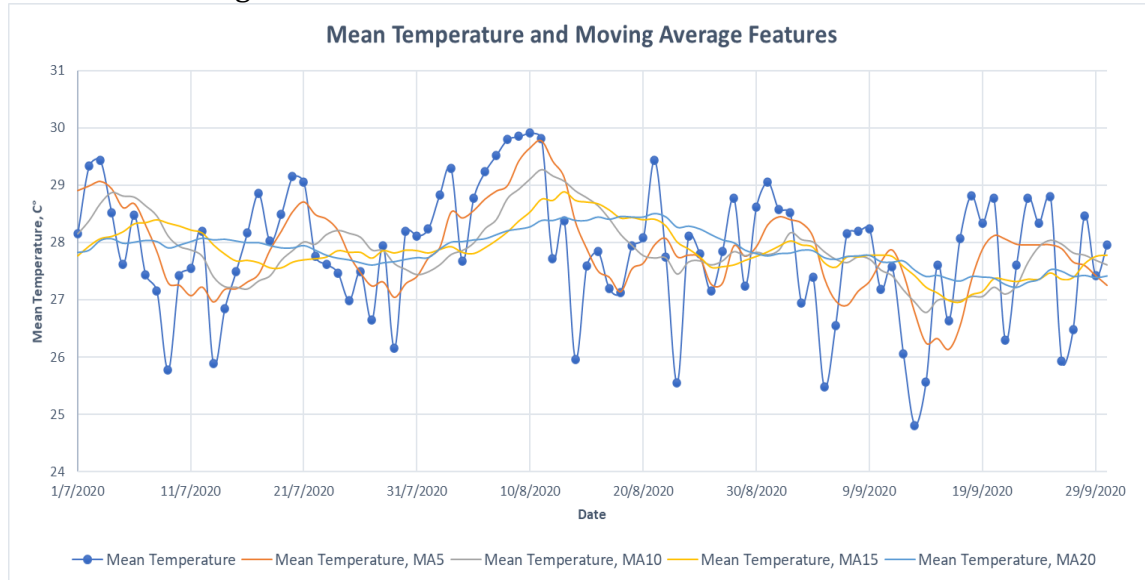


Figure 2: Mean Temperature and Moving Average Features

- Model cross validation
After the process of data pre-processing, feature engineering, model selection and model tuning, the performance of prediction model has been improved a lot from the initial stage. The dataset has been split into training/ test dataset for cross validation. It found the feature input expansion contribute on the model accuracy. Below table shows the comparison between original weather data and expanded feature after considering moving average, past data and cross-correlation dengue cases.

	MAE	
	Training	Test
Original Weather Data Only, 6 features	22.53	30.85
Moving Average and Past Weather Data Added, 55 features	7.85	15.61

Table 2: Comparison of the Prediction Results with Different Feature Table

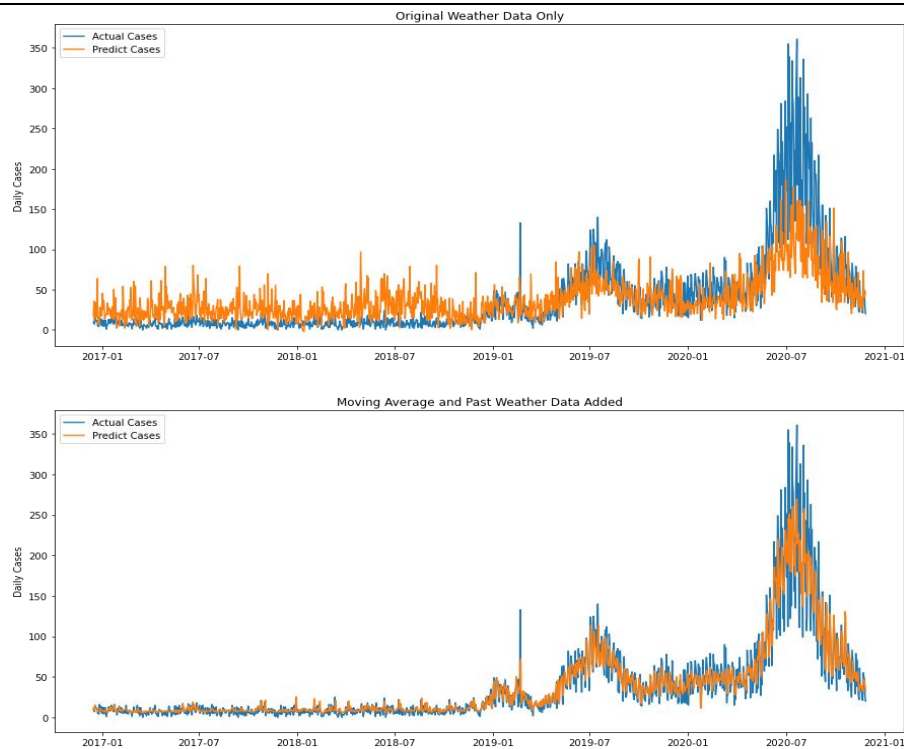


Figure 3: Comparison of the Prediction Results with Different Feature

2. What I have learnt that is most useful ?

The process of Machine Learning problem is the most useful learnt for this project. From Data Collection -> Pre-processing -> Feature Engineering -> Model Selection -> Model Tuning -> Model Validation -> Model Implementation. This project enhances me the understanding of using Machine Learning to understand the nature of problem on different areas.

3. How I can apply this knowledge and skills in other situations or my workplace ?

There are many applicable areas to use the knowledge and skills acquire from this group project, such as:

- Prediction the mode of transportation after cargo arrival, based on previous track record, cargo type and departure location. The next mode of transportation can be predicted to optimize the transportation resources at port, including, vessel, train, truck, and airplane.
- Based on the upstream activity and macro economy data, to help the financial department to predict the revenue/ budget/ output on the next year