DENGUE DASBOARD FOR FORECASTING THE FUTURE TREND OF DENGUE CASES IN PAHANG USING AUTO REGRESSION INTEGRATED MOVING AVERAGE (ARIMA) MODEL

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LINK TO DENGUE DASHBOARD

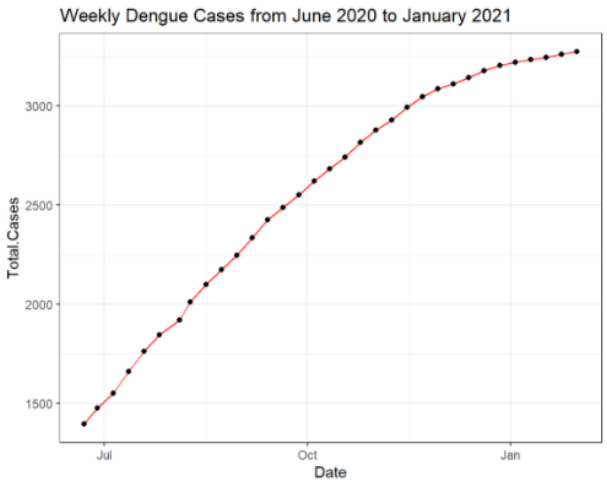
INTRODUCTION

The case study of this project is focuses on developing a dengue dashboard for forecasting the future trend of dengue cases in Pahang from 2021 to 2023 using ARIMA model. This dashboard also includes the latest information regarding the total number of dengue cases in Pahang, total deaths caused by dengue in Pahang, total cases according to each district in Pahang, interactive map of dengue cases in Pahang and a graph displaying the future trend of dengue cases.

OBJECTIVES

- To develop a predictive model of the future trend of dengue cases using Auto Regressive Integrated Moving Average (ARIMA) model.
- To develop a dashboard for dengue cases in Pahang.
- To validate the prediction accuracy of ARIMA model using RMSE.

PROBLEM STATEMENT



The number of dengue cases in Pahang keep rising weekly. Hence, this project proposed a dengue dashboard and forecasting the future trend of dengue cases in Pahang as a preventive measurement in controlling the rising number of dengue cases in Pahang.

METHODOLOGY

Auto Regressive Integrate Moving Average (ARIMA) Model

1. **Data collection** — Time-series data collected from JKN Pahang Facebook page.
2. **Stationary test** — Only stationary data can be used. Apply regular differences if the data is not stationary
3. **Create ARIMA model**
4. **Choose the best-fitted ARIMA model**
5. **Forecast using chosen ARIMA model**
6. **Evaluation test using RMSE** — Lower RMSE value, higher the accuracy

NOVELTY

- Collected data sets from social media, JKN Pahang Facebook page.
- Provide latest news regarding dengue cases in Pahang.
- Provide an interactive map displaying the green and red zone.

INVENTIVENESS

- Applying data analytic and visualization using R language.
- Applying artificial intelligence (AI) by using Auto Regression Integrated Moving Average (ARIMA) model to forecast the future trend of dengue cases in Pahang from 2021 to 2023.

USEFULNESS

- Assist JKN Pahang in taking a preventive measure regarding the rising figure of dengue cases in Pahang.
- Foster public awareness

RESULTS

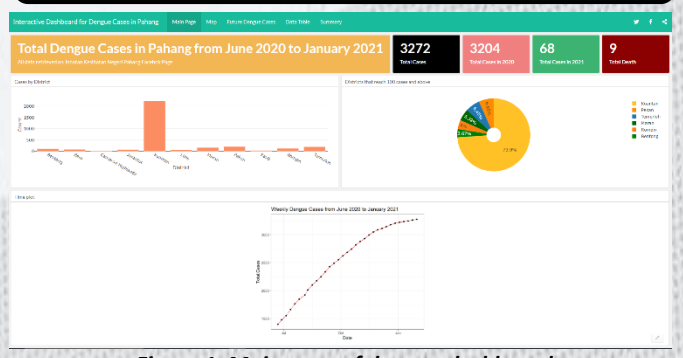
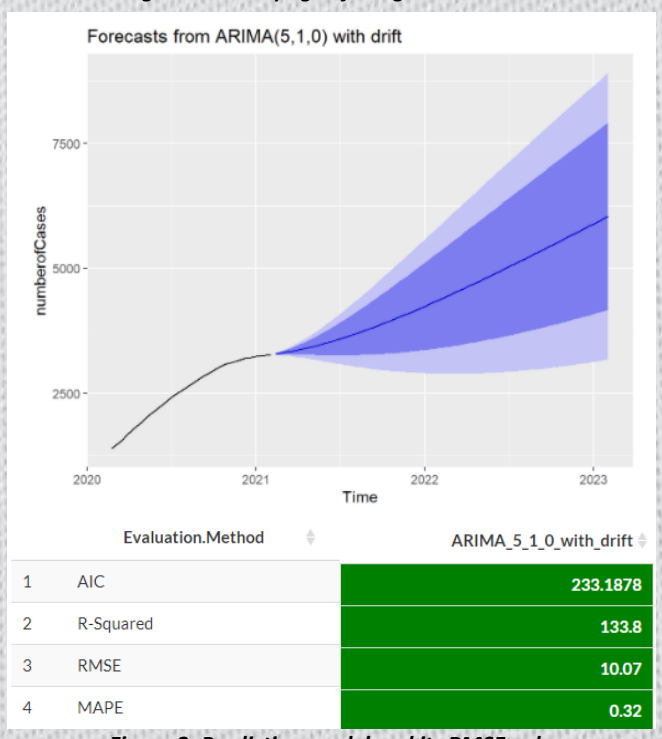


Figure 1: Main page of dengue dashboard



	Evaluation.Method	ARIMA_5_1_0_with_drift
1	AIC	233.1878
2	R-Squared	133.8
3	RMSE	10.07
4	MAPE	0.32

Figure 2: Prediction model and its RMSE value

CONCLUSION

Hence, we can clearly see the number of dengue cases is linearly increasing from 2021 to 2023 which can be up to 6,000 dengue cases in 2023.

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