UNIVERSITI TEKNOLOGI MARA

SAFETERENGGANU: PREDICTING CRIME TRENDS IN TERENGGANU USING PREDICTIVE ANALYTICS

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ABSTRACT

Crime monitoring in Terengganu is essential since the monitoring can help the police authorities to gain insight, find crime patterns and make an early action based on the highest crime type. The current manual crime analysis was time consuming and difficult to effectively predict future crime and comparisons. This project created a crime trend prediction dashboard for Terengganu by analysing past crime data, forecasting future crime numbers and identifying district level hotspot risks. The project utilized the CRISP-DM methodology that includes project planning, business understanding, data understanding, data preparation, modelling, evaluation and deployment. The crime historical data from 2021 until 2025 was prepared and modelled in RapidMiner and the dashboard was created in Power BI. The test was conducted on 70% data for training and 30% for testing, with three regression algorithms which are Linear Regression, Decision Tree and Random Forest. The model performances were assessed based on regression evaluation which are RMSE, MAE and R^2. In result, Decision Tree performed best in predicting the crime trends with the lowest error values of RMSE which is 21.375 and MAE as 17.958, while Linear Regression had the highest R^2 value of 0.839. Besides, Decision Tree gave the best overall performance on prediction of total crimes type by district in Terengganu with RMSE 8.912, MAE 4.632, and R^2 of 0.929 and was chosen as the primary prediction model. The dashboard displays descriptive crime analysis and district analysis by total population, predicted crime trends and types with high-risk area to aid quicker interpretation of crime data. Overall, this project was evaluated with three different expert and indicated that the dashboard was successful in achieving its goals using DATUS evaluation method. Furthermore, several recommendations for interface design and improve dataset needed to enhance this prediction.