

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**TIME SERIES ANALYSIS OF RAINFALL IN PERLIS USING
BOX-JENKINS METHOD
(P41M22)**

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ABSTRACT

Precipitation, also known as rain, is a natural phenomenon of nature that is formed through the process of condensation. Rainfall prediction on seasonal and monthly time series is not only scientifically challenging but is also important for planning and devising strategies for the agricultural sector. Perlis is one of the states in Malaysia that is known for the agricultural production of sugarcane and rice straw. The focus of this study is to discover how challenging it is to analyze and determine the rainfall pattern using Box-Jenkins method hence this study is conducted to examine the pattern of monthly rainfall at selected areas in Perlis using data of rainfall from 2015 to 2020 which was obtained from the Department of Meteorology Malaysia. The study indicated that the monthly rainfall data in Perlis has a seasonal and trend pattern based on Autocorrelation Function (ACF) and Partial Correlation Function (PACF). Hence, the Box-Jenkins method was used in this study to investigate the pattern of rainfall and forecast future values of rainfall in 2021 and 2022 by analyzing the previous six years' data (2015 - 2020). At the end of this study, the best fit models of the ARIMA model and SARIMA model had been compared to choose the best model to forecast future rainfall based on the lowest error measurements of Mean Absolute Error (MAE), Mean Square Error (MSE) and Mean Absolute Percentage Error (MAPE). Findings indicated that the best model to forecast future rainfall is the SARIMA (1,0,1)(1,1,1)₁₂ model. The method is therefore adequate and appropriate to forecast future monthly rainfall, especially for short-term forecasting to help various sectors such as agriculture and other industries.