

**A COMPARATIVE ANALYSIS OF MODELLING APPROACHES
FOR UNEMPLOYMENT PREDICTION IN RECENT
UNIVERSITY GRADUATES IN MALAYSIA**

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ABSTRACT

This thesis explores three distinct mathematical modelling approaches—Malthusian growth, Monte Carlo simulation, and Runge-Kutta Fourth (RK4) method to predict and analyse the unemployment rates of recent university graduates over a span of ten years. The accuracy of each method is determined by the different model characteristics. The study utilises actual data from 2012 to 2021 and employs each method to interpolate and predict the number of unemployed fresh graduates in Malaysia for the subsequent decade. Interpolation allows the predictability of each method to be observed and compared to actual data collected, providing evidence for each method's precision in modelling unemployed fresh graduates in Malaysia. The comparative analysis involves evaluating the Root Mean Square Deviation (RMSD) for each method, providing insights into the accuracy and reliability of the predictions. The Runge-Kutta Fourth (RK4) method achieves the lowest Root Mean Square Deviation (RMSD) value among the three modelling methods examined, indicating that it is the most accurate. This emphasises how RK4 method models the number of unemployed fresh graduates effectively in comparison to the Monte Carlo simulation and Malthusian growth approaches. Each model is encoded separately in the Python software for the purpose of results and analysis. The findings from this research aim to contribute to a deeper understanding of the effectiveness of these modelling techniques in predicting the number of unemployment among recent university graduates.

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