APPLICATION OF LAGRANGE INTERPOLATION AND NEWTON'S INTERPOLATION TO PREDICT THE RATE OF MALAYSIAN'S UNEMPLOYMENT IN 2023

MUHAMMAD SYAHRUDDIN BIN MOHD HILMY

Thesis Submitted in Fulfilment of the Requirement for Bachelor of Science (Hons.) Mathematical Modelling and Analytics College of Computing, Informatics and Mathematics Universiti Teknologi Mara

August 2023

ABSTRACT

Unemployment rates are critical economic indicators that reflect the health and stability of a nation's labour market. Accurate predictions of future unemployment rates are essential for policymakers, researchers, and businesses to formulate effective strategies and make informed decisions. This project focuses on the application of Lagrange interpolation and the Newton's Interpolation to predict the rate of Malaysian unemployment in 2023. Additionally, we apply the Newton's Interpolation to refine the predictions and assess its effectiveness in enhancing the accuracy of the forecasts. The results obtained from both the Lagrange interpolation and Newton's Interpolation will be compared and evaluated. By examining the performance of these methods, we can gain insights into their applicability and suitability for predicting the rate of Malaysian unemployment in 2023. Overall, this project contributes to the field of numerical analysis by demonstrating the practical application of Lagrange interpolation and the Newton's Interpolation in forecasting economic indicators. The findings and methodologies presented here can assist policymakers, economists, and researchers in making informed decisions, formulating policies, and designing strategies to address unemployment challenges in Malaysia and potentially in other countries as well.

ACKNOWLEDGEMENT

Alhamdulillah. Firstly, I would like to praise Allah S.W.T, the Glorious and the Almighty for given me His blessing and giving me a strength during my study to complete this research.

Furthermore, I would like to express my deepest and big sincere thanks to my lovely supervisor, Madam Zamzulani Mohamed, for never getting tired of giving guidance, supervision, and encouragement to me until the completion of my final research. I feel very grateful to have her as my supervisor because her patience with me and helping me regardless of time. I also would like to extend my gratitude and thanks to Dr. Atikah Binti Salahudin, the Coordinator of final Year Report, for her guidance in finishing this report.

My enormous appreciation goes to my wonderful mother, sister, and family, who always continuously given wholeheartedly support and belief throughout my study. Their endless love always gives and provide me a strength and motivation during the hardest time. Next, I would like to thank all my friends especially Raihanah Binti Rosle for their companion and support mentally throughout this research.

Finally, special thanks to Universiti Teknologi MARA for giving me the chance and opportunity in my studies. I owe a lot of deal to everyone for their understanding, sacrifices, support, and motivation that enable me to achieve my goals.

TABLE OF CONTENTS

		Page
DECLA	ARATION BY THE SUPERVISOR	i
DECLA	ARATION BY THE CANDIDATE	ii
ABSTF	RACT	iii
ACKN	OWLEDGEMENT	iv
TABLE	E OF CONTENTS	v
LIST C	OF TABLES	viii
LIST C	OF FIGURES	ix
INTRO	DOUCTION OF RESEARCH	1
1.1	Introduction	1
1.2	Background Study	1
1.3	Problem Statement	3
1.4	Objectives	4
1.5	Significance of the Project	5
1.6	Scope of the Project	7
1.7	Project Benefits	7
1.8	Definition of Terms and Concept	8
1.9	Organization of Report	10
LITER	ATURE REVIEW	12
2.1	Introduction	12

2.2	Literature Review	12
2.2.	.1 Lagrange Interpolation Method	12
2.2.	.2 Newton's Interpolation	15
2.2.	.3 Unemployment Rate and Predictions	17
2.3	Conclusion	19
МЕТНО	ODOLOGY	20
3.1	Introduction	20
3.2	Research Steps	20
IMPLE	MENTATION	26
4.1	Introduction	26
4.2	Data	26
4.3	Lagrange Interpolation Method	27
4.4	Newton's Interpolation	30
4.5	Root Mean Squared Errors (RMSE)	35
4.5.	.1 Lagrange interpolation	35
4.5.	.2 Newton's Interpolation	36
4.6	Conclusion	38
RESUL	T AND DISCUSSION	39
5.1	Introduction	39
5.2	Result and Analysis	39