THE EFFECT OF RUNGE-KUTTA IN ADAMS-BASHFORTH METHOD FOR SOLVING FIRST ORDER ORDINARY DIFFERENTIAL EQUATION

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Thesis submitted in fulfilment of the requirement for
Bachelor of Science (Hons.) Mathematical Modelling and Analytics
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August 2023

ABSTRACT

Numerical problems can be solved using the multi-step method. Adams-Bashforth method is one of the multi-step methods that are often used together with Runge-Kutta as a starter to the multi-step. The objective of this study is to compare the numerical method using Adams-Bashforth method with theoretical method using linear differential equation, separable differential equation and Bernoulli's differential equation and to find the accuracy between these two methods, to determine which order of Runge-Kutta are more accurate in AB2, AB3 and AB4. Hence, each order of Adams-Bashforth has been applied with RK3, RK4 and RK5 and the results has been compared with the exact solution in order to find the error. The Graphical User Interface (GUI) has been used to solve this problem. The highest accuracy in this study reached at h=0.01. Then, the best order of Runge-Kutta AB2 and AB4 is when applied together with RK4, while the best order of Runge-Kutta for AB3 is when applied together with RK3. The findings of this study, to determine which step of Adams-Bashforth more accurate to RK2, RK3, RK4 and the results of this study can be used in any fields of study.

ACKNOWLEDGEMENT

First and foremost, I want to thank Allah for paving the way me to complete my final year project (FYP) on time. I would seek to express my gratitude to everyone who has contributed to the completion of my project, whether directly or indirectly. I would like to thank my supervisor, Dr. Nur Atikah binti Salahudin, for her moral support, advice, and encouragement over these two semesters. Her insightful recommendations and advice have really assisted in the improvement of my report. I would want to take this opportunity to thank Dr. Mohd Rivaie bin Mohd Ali for coming up with this idea and believing in me for conducting this study. Next, I want to thank Madam Nur Idalisa binti Norddin for her assistance in running the Matlab programming, as well as her support and drive in completing my research. Their academic and professional skills have been invaluable in my growth and education. Furthermore, I would like to thank Muhammad Hanif bin Ghazali for his contribution to my GUI until achieved the result. Then, I would like to thank to my very supportive friend, Nurul Nisrina binti Norwan for always giving me moral support, ideas, and contribute a lot in my research. Last but not least, I want to thank my family and friends for their encouragement, moral support, and advised when I felt like giving up and feeling upset.

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