

**APPLICATION OF AIR POLLUTION DATA IN KLANG,
SELANGOR TO FIND MULTIPLE ROOTS**

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**Thesis Submitted in Fulfilment of the Requirement for
Bachelor of Science (Hons.) Mathematical Modelling and Analytics
College of Computing, Informatics and Mathematics
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July 2023

ABSTRACT

Many types of methods such as Halley's and super-Halley method, modified Newton's method, and Schröder's method can be used in finding multiple roots of nonlinear equations. Some methods cannot be used for finding multiple roots such as Newton's method, Bisection method, Secant method, Muller's method, and many more. Thus, the modifications of some methods did by few researchers. This project will find the month that has highest value of mean concentration of PM₁₀ and PM_{2.5} with the value of concentrations. Next, this project will be implementing the highest mean concentrations of particulate matter which are PM₁₀ and PM_{2.5} in Klang as the initial guesses for finding multiple roots. Lastly, every function with different initial guess has its own best method by identifying the smallest error and smallest CPU time. For Modified Newton's method, it is best to use on function $(e^{-x^2} - e^{x^2} - x^8 + 10)^{30}$ with initial guess 33.41. For Method 1 (M1), it is best to use on function $(e^{-x^2} - e^{x^2} - x^8 + 10)^{30}$ with initial guess 44.51, function $(6x^5 + 5x^4 - 4x^3 + 3x^2 - 2x + 1)^{55}$ with initial - 2.0 and 33.41, function $(\ln[x^2 + 3x + 5] - 2x + 7)^{31}$ for all initial guesses. Method 4 (M4) is best to use on function $(e^{-x^2} - e^{x^2} - x^8 + 10)^{30}$ with initial guess 1.3 and function $(6x^5 + 5x^4 - 4x^3 + 3x^2 - 2x + 1)^{55}$ with initial guess 44.51.

ACKNOWLEDGEMENT

First of all, I would like to express my special thanks of gratitude to Department of Environment (DOE) Malaysia for approving my application and providing the required data so that this study could be carried out. Without the data provided from Department of Environment (DOE), I might have problem on determining the initial guesses since the selection of initial guesses is sensitive.

Next, I would like to acknowledge and give my warmest thanks to my supervisor, Dr. Nur Atikah binti Salahudin who made this thesis possible. Her guidance and advice carried me through all the process of writing the proposal, apply the needed data at Department of Environment's website and writing the completed thesis. A special thanks to Dr. Mohd Rivaie bin Mohd Ali, who helped me changing the method and find the article for my final year project. Without his guidance, I might be lost and stuck with previous method and my thesis cannot be done in time which I cannot complete my study and cannot graduate on time.

Lastly, many thanks to my family and my boyfriend, Arman Syahir bin Afandi because they gave me all the support by physically, mentally and emotional during I did this thesis. Without their support, I cannot complete this thesis because my mental has up and downs while I write this thesis.

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