AN APPLICATION OF LEAST SQUARE METHOD AND STEEPEST DESCENT METHOD FOR SOLVING SECOND ORDER DIFFERENTIAL EQUATION

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DECLARATION BY CANDIDATE

I certify that this report and the project to which it refers is the product of my own work and that any idea or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

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ABSTRACT

Ordinary differential equations (ODE) are one of the important and widely used techniques in mathematical modelling. This method requires finding the solution theoretically. However, some of the theoretical method uses to find the solutions are extremely complicated. Least Square method is one of the numerical methods that can be used for finding an approximation for the solution of ODE without solving it theoretically. However, this method requires finding the inverse of matrix which sometime does not exist for a singular matrix. Thus, to avoid this problem Steepest Descent method is used together with Least Square method. This research analyses the efficiency of least square method and Steepest Descent method for the approximation of ODE solution numerically compared to the theoretical solution. Result shows that the numerical solution approximation is comparable to the theoretical solution without finding the true solution.

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