

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**STOCK MARKET FORECASTING USING GEOMETRIC
BROWNIAN MOTION BY APPLYING THE BEST
VOLATILITY MEASUREMENT**

**FARAH SYAHIDA BINTI FAUZI (2022905887)¹
SABIHAH MAISARAH BINTI SAHRUDIN (2022793913)¹
NUR ASYIKIN BINTI ABDULLAH (2020872626)²
(P34S23)**

**Supervisor:
Mrs Siti Nazifah Zainol Abidin**

**Bachelor of Science (Hons.) (Management Mathematics)¹
Bachelor of Science (Hons.) Mathematics²
College of Computing, Informatics and Mathematics
UNIVERSITI TEKNOLOGI MARA**

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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

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ABSTRACT

Investing in stocks Malaysia can be overwhelming due to the abundance of possibilities, necessitating informed decision-making to navigate the volatile market. This study addresses a common problem faced by investor venturing into the stock market, where instability and fluctuations pose risks and lead to losses stemming from inadequate knowledge about suitable stocks for investment. Unlike many studies focusing on long-term forecasting methods, this research adopts the Geometric Brownian Motion (GBM) model for short-term investment. The study's objectives include identifying the best volatility measurement model, developing a forecasting model using GBM based on the chosen volatility model, and evaluating the accuracy of the GBM model through Mean Square Error (MSE), Mean Absolute Percentage Error (MAPE), and Mean Absolute Deviation (MAD). Four volatility models are simple volatility, log volatility, high-low volatility, and high-low-closed volatility which considered to determine the most effective volatility measurement model. Data collecting four months is employed, ensuring daily accuracy, and excluding factors such as seasonality, politics, natural disasters, and wars. The findings indicate that the simple volatility model is the most suitable for forecasting stock market trends with the GBM model and demonstrating high accuracy by MSE, MAPE and MAD.