COMPARISON OF MOMENT AND MAXIMUM LIKELIHOOD METHODS IN ESTIMATING PARAMETER GAMMA DISTRIBUTION

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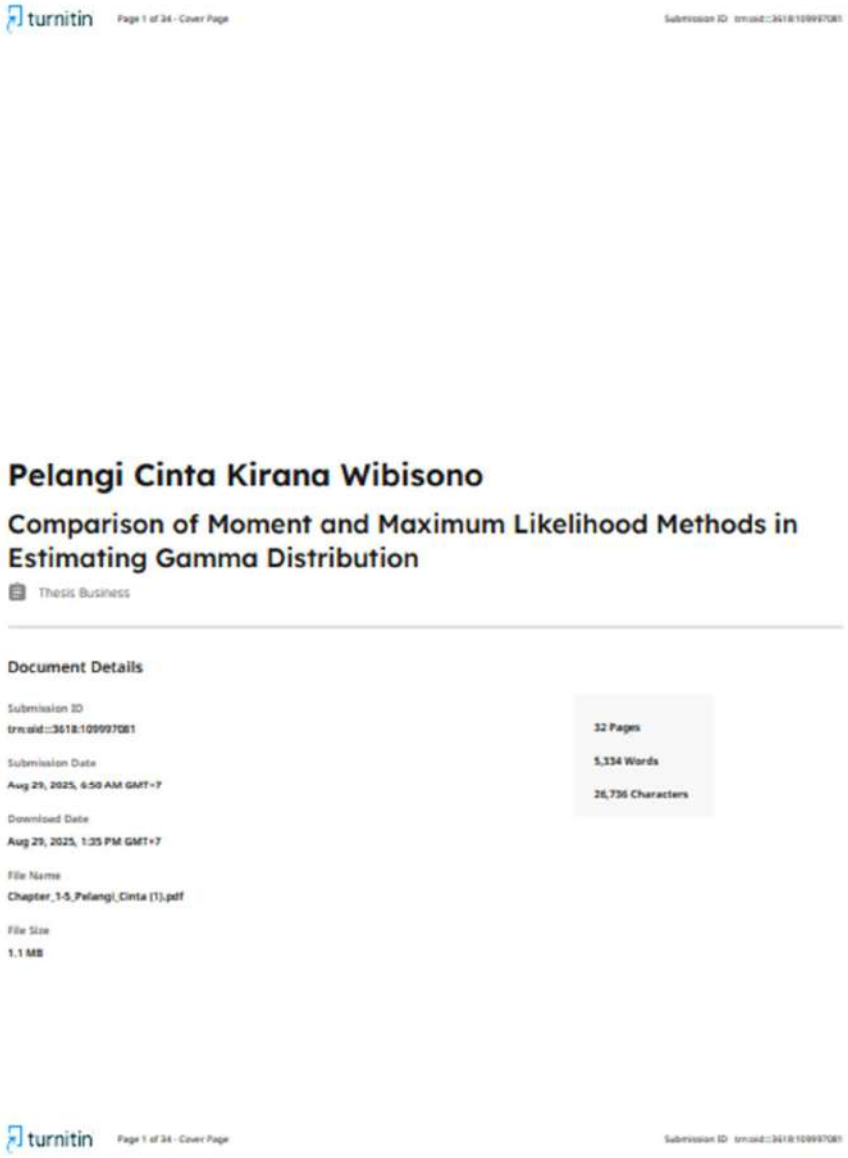

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ABSTRACT

Claim prediction plays a crucial role in the insurance industry, enabling companies to design suitable insurance policies for potential policyholders. One approach to predicting claims involves using the parameters of the gamma distribution. Several methods can be applied, including Maximum Likelihood Estimation (MLE), the Method of Moments (MoM), and the Bayesian method. This study focuses on comparing the MoM and MLE methods to determine the most effective approach for predicting insurance claim frequency using Google Collab. The analysis is based on secondary data obtained from Kaggle. The MoM estimates parameters by equating k sample moments with the corresponding k population moments, while MLE works by maximizing the likelihood function. The findings indicate that MLE produces a lower error rate of 0.424%, compared to 0.6845% for MoM. This suggests that Maximum Likelihood Estimation (MLE) provides higher accuracy in predicting insurance claim frequency.

Keywords: *Parameter Estimation, Maximum Likelihood Estimation, Method of Moment, Gamma Distribution*

ABSTRAK

Prediksi klaim memainkan peran penting dalam industri asuransi, memungkinkan perusahaan untuk merancang polis asuransi yang sesuai bagi calon pemegang polis. Salah satu pendekatan untuk memprediksi klaim adalah dengan menggunakan parameter dari distribusi gamma. Beberapa metode yang dapat diterapkan meliputi Maximum Likelihood Estimation (MLE), Method of Moments (MoM), dan metode Bayesian. Penelitian ini berfokus pada perbandingan metode MoM dan MLE untuk menentukan pendekatan yang paling efektif dalam memprediksi frekuensi klaim asuransi menggunakan Google Colab. Analisis ini didasarkan pada data sekunder yang diperoleh dari Kaggle. MoM memperkirakan parameter dengan menyamakan k momen sampel dengan k momen populasi yang sesuai, sedangkan MLE bekerja dengan memaksimalkan fungsi likelihood. Hasil penelitian menunjukkan bahwa MLE menghasilkan tingkat kesalahan yang lebih rendah, yaitu 0,424%, dibandingkan dengan 0,6845% untuk MoM. Hal ini menunjukkan bahwa Maximum Likelihood Estimation (MLE) memberikan akurasi yang lebih tinggi dalam memprediksi frekuensi klaim asuransi.

Keywords: *Estimasi Parameter, Metode Maximum Likelihood, Metode Momen, Distribusi Gamma*

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