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**PART 1: Review Comments**  
**Compulsory REVISION comments**

|  | Reviewer's comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Author's Feedback (Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here) |
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|  | <p>Strengths and Weaknesses of the Research</p> <p><b>**Strengths**</b></p> <ol style="list-style-type: none"><li><b>**Relevance to Industry**:</b><br/>-The research addresses a pressing issue in the insurance industry: the need for more advanced methods to predict claim frequency in the era of big data. This makes the research highly relevant to current industry challenges, particularly in risk assessment and pricing.</li><li><b>**Clear Justification for XGBoost**:</b><br/>-The authors provide a strong rationale for choosing the Extreme Gradient Boosting (XGBoost) algorithm. They highlight the inadequacies of traditional statistical and actuarial methods when dealing with the large, varied, and potentially incomplete data sets generated in the insurance industry. XGBoost's ability to handle these issues gives a clear reason for its use.</li><li><b>**Solid Evaluation Metrics**:</b><br/>-The research employs widely accepted evaluation metrics (RMSE, MAE, and R-squared) to assess the model's performance. These metrics are appropriate for measuring the accuracy and effectiveness of predictive models, providing clarity on the model's reliability.</li><li><b>**Addressing Data Characteristics**:</b><br/>-The research effectively addresses the unique characteristics of the insurance claim data, notably its Poisson distribution with many zeros. This demonstrates a solid understanding of the data's structure and the challenges it presents for modeling.</li><li><b>**Comprehensive Overview of XGBoost**:</b><br/>-The paper provides a good explanation of XGBoost's inner workings, including how it iteratively fits decision trees and reduces errors at each stage. This is beneficial for readers who may be unfamiliar with the algorithm, ensuring the paper is accessible to a wider audience.</li><li><b>**Strong Quantitative Results**:</b><br/>-The reported results show that the XGBoost model performs well with low RMSE and MAE values, and a relatively high R-squared value of 0.781. This indicates that the model is effective in predicting claim frequency and provides empirical support for the conclusion that XGBoost is the optimal choice for this task.</li></ol> <p><b>**Weaknesses**</b></p> <ol style="list-style-type: none"><li><b>**Lack of Comparison with Other Models**:</b><br/>-One major limitation is the lack of comparison between XGBoost and traditional or other machine learning models (e.g., logistic regression, random forests, neural networks). Without benchmarking XGBoost against these methods, it's difficult to claim definitively that it is the "optimal model" for predicting insurance claim frequency.</li></ol> |                                                                                                                                                              |

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|                                                                                                                                                                                                                              | <p>2. <b>Confusion Matrix Misapplication</b>:<br/>         -The mention of using a confusion matrix to evaluate the XGBoost model is puzzling since confusion matrices are typically used for classification problems, not regression tasks like frequency prediction. This suggests a potential misunderstanding or misapplication of evaluation methods, which could undermine the credibility of the analysis.</p> <p>3. <b>Over-reliance on Technical Metrics</b>:<br/>         -While RMSE, MAE, and R-squared are useful for evaluating model performance, the research would benefit from including more practical metrics relevant to the insurance industry, such as the impact on profitability, risk management, or customer segmentation. The focus on purely technical metrics limits the study's application in a real-world context.</p> <p>4. <b>Limited Exploration of Big Data Challenges</b>:<br/>         -Although the abstract mentions the challenges of big data, such as handling missing values, the paper does not delve into how XGBoost specifically addresses these issues compared to other algorithms. For example, a deeper exploration of how XGBoost deals with missing data or outliers would strengthen the research.</p> <p>5. <b>Absence of Practical Implications</b>:<br/>         -The paper does not sufficiently discuss the practical implications of using XGBoost in insurance companies. While the model performs well on technical metrics, the study could be improved by detailing how its application would enhance decision-making processes, pricing strategies, or risk assessments in insurance companies.</p> <p>6. <b>Future Directions Not Addressed</b>:<br/>         -The paper lacks a discussion of potential future research directions. Exploring how the model could be refined, used in combination with other algorithms, or adapted to different insurance products would add depth to the research and suggest its ongoing relevance.</p> <p>7. <b>Incomplete Explanation of Results</b>:<br/>         -Although the results are promising, the significance of the RMSE, MAE, and R-squared values is not fully explored in context. The authors should clarify what these results mean in practical terms for an insurance company. For example, how do these metrics translate into improved risk prediction or financial outcomes?</p> <p>8. Overall, the research on using XGBoost for motor insurance claim frequency prediction is promising and relevant, with strengths in its choice of methodology, understanding of data characteristics, and clear results. However, the study has significant weaknesses, including the lack of comparison with other models, potential misapplication of evaluation methods, and a limited focus on practical industry implications. Addressing these weaknesses would make the research more comprehensive and impactful for both academic and industry audiences.</p> |  |
| <p><b>Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.</b></p> | <p>yes</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |

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| Is the title of the article suitable?<br>(If not please suggest an alternative title)                                                                                                                                                 | yes      |  |
| Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.                                                                           | somewhat |  |
| Are subsections and structure of the manuscript appropriate?                                                                                                                                                                          | yes      |  |
| Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part. | yes      |  |
| Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.<br>-                                                                                              | somewhat |  |
| <u>Minor REVISION</u> comments<br><br>Is the language/English quality of the article suitable for scholarly communications?                                                                                                           | somewhat |  |
| <u>Optional/General</u> comments                                                                                                                                                                                                      |          |  |

**PART 2:**

|                                              | Reviewer's comment                                                           | Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here) |
|----------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Are there ethical issues in this manuscript? | <i>(If yes, Kindly please write down the ethical issues here in details)</i> |                                                                                                                                                                               |

**Reviewer Details:**

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