In this report, we addressed X Education's challenge of improving its lead conversion rate. Through the use of logistic regression modeling in Python, we aimed to identify the most promising leads, or 'Hot Leads,' to optimize resource allocation and increase the conversion rate. Our analysis revealed several key findings.

Firstly, we observed that maximum lead conversions occurred through Landing Page Submissions. Additionally, the majority of conversions came from leads sourced through Google. Furthermore, the Unemployed group exhibited a higher conversion rate compared to other occupation categories. Features such as Total Visits, Total Time Spent on the Website, and Page Views Per Visit also had a significant impact on lead conversion. Lastly, the analysis highlighted the effectiveness of email campaigns in driving conversions.

To evaluate our logistic regression model's performance, we measured sensitivity, specificity, precision, recall, and accuracy on both the train and test datasets. The model achieved a sensitivity of 82.48 and a specificity of 74.46 on the train set, while on the test set, it achieved a sensitivity of 84.57 and a specificity of 73.23. These results indicated that the model performed consistently and had a good ability to adjust to the company's requirements.

Based on the probability of conversion, the leads were ranked, with higher scores indicating hotter leads. It was recommended that the business focus on leads with higher scores to achieve better conversion rates.

In conclusion, the logistic regression model demonstrated stability and performed well in terms of sensitivity, specificity, accuracy, precision, and recall. It was capable of adapting to the company's future requirements. Key features that significantly contributed to lead conversion included Lead Origin_Lead Add Form, Total Time Spent on the Website, and the occupation category Working Professional.

By leveraging the insights gained from this analysis, X Education can strategically allocate its resources and concentrate efforts on the most promising leads. This targeted approach is expected to improve the lead conversion rate, optimize sales team productivity, and ultimately drive the company's overall success in the online education market.