Lead Scoring Case Study

Optimizing Lead Scoring with Logistic Regression

Submitted by

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Problem Statement

- X Education receives a large number of leads through its website and referrals, but the lead conversion rate is only around 30%.

- The sales team engages with all leads, regardless of their potential, which leads to inefficient use of resources.

- The company struggles to identify which leads are most likely to convert into paying customers, resulting in wasted effort and missed opportunities. As a result, the conversion process is not optimized, and valuable leads are often overlooked.

Business Objective

- The goal is to develop a lead scoring model to prioritize high-potential leads based on their likelihood to convert.

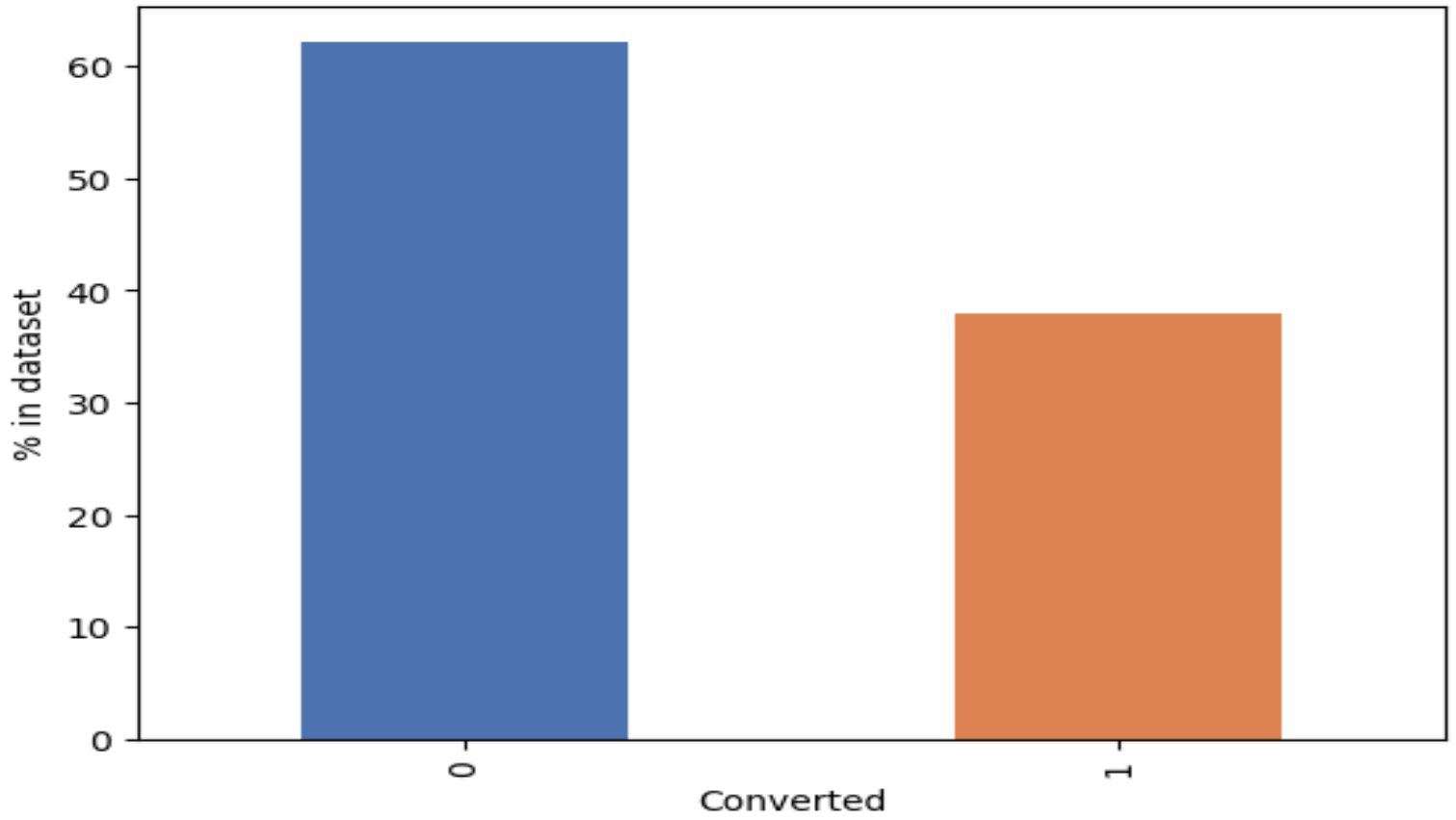
- By assigning lead scores, the sales team can focus on the most promising prospects, improving the efficiency of the lead conversion process.

- The target conversion rate is to increase to 80%, which will optimize the sales process, increase overall revenue, and ensure better resource allocation for both sales and marketing efforts.

Steps Followed

- Reading Data
- Cleaning Data
- Data Visualization
- Data Preparation
- Model Builiding
- ROC Curve
- Model Evaluations
- Prediction on test set
- Conclusion

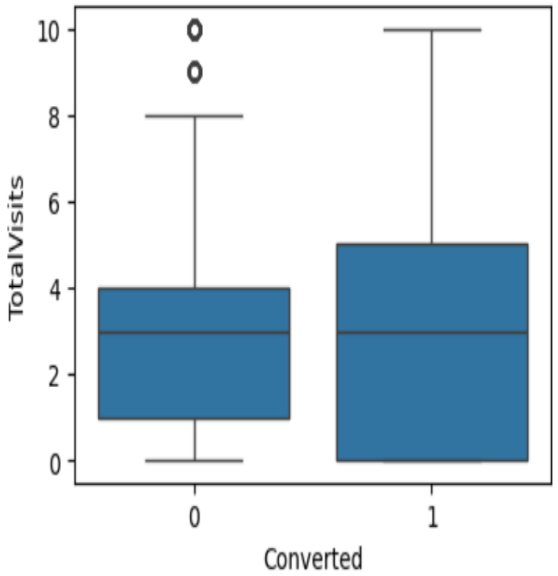
Target variable

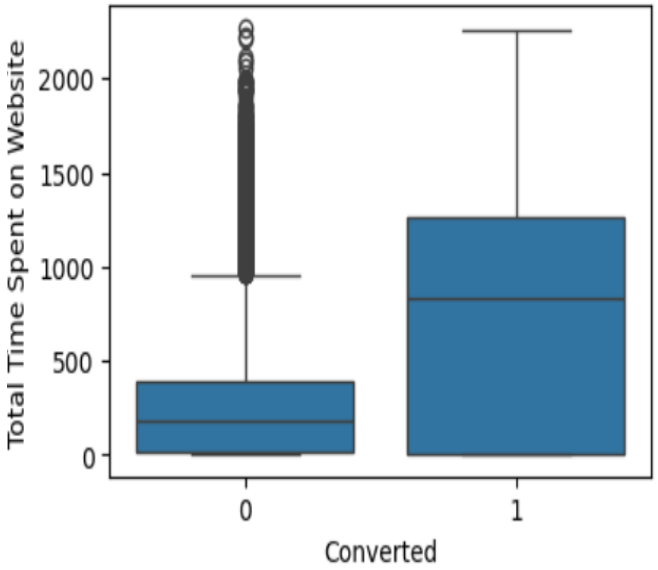


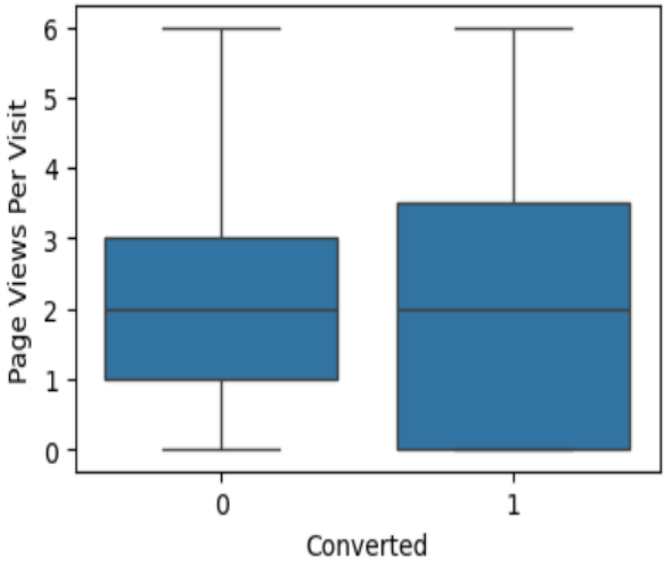
The data is imbalanced, with 38% of leads converting and 62% not converting, showing a disproportionate distribution between the two classes.

Data Visualization

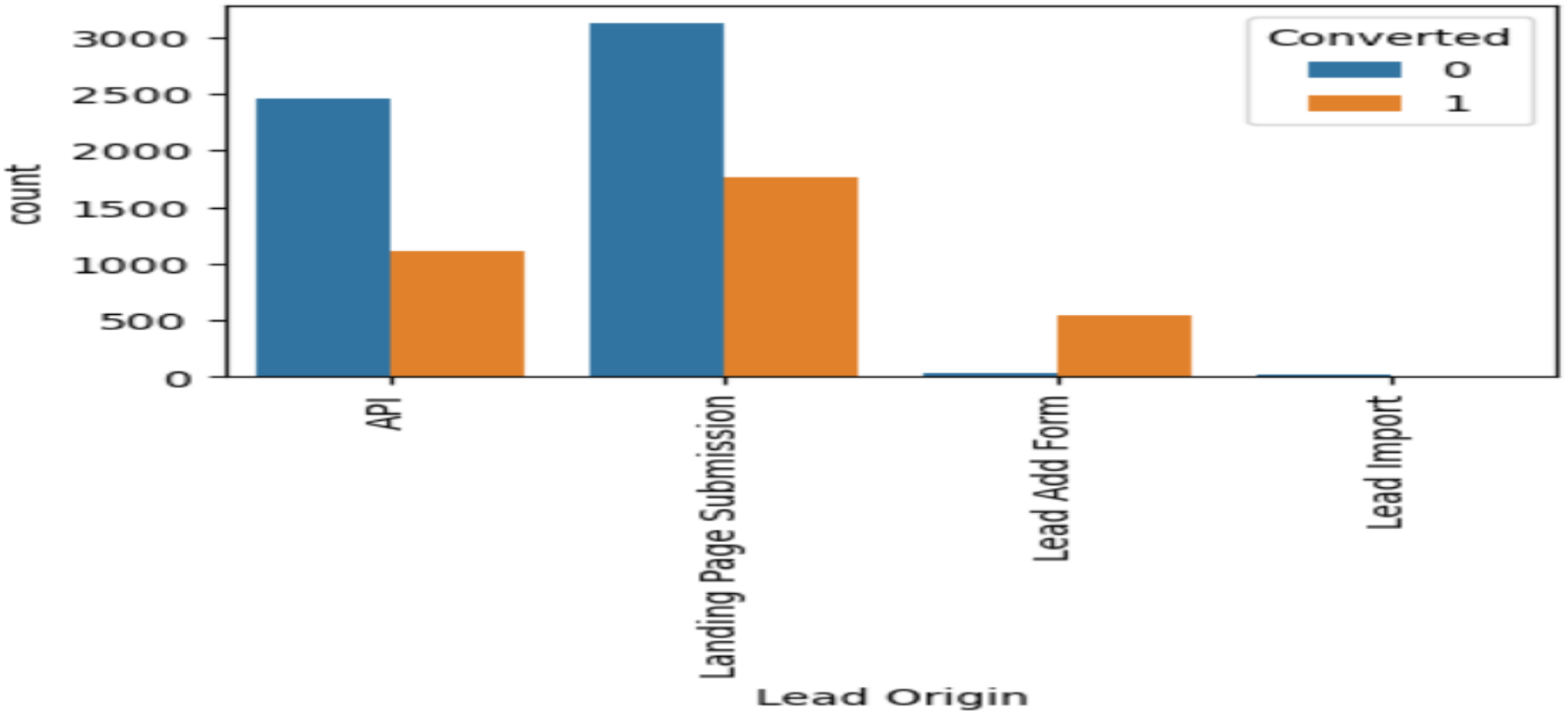
Identifying important features



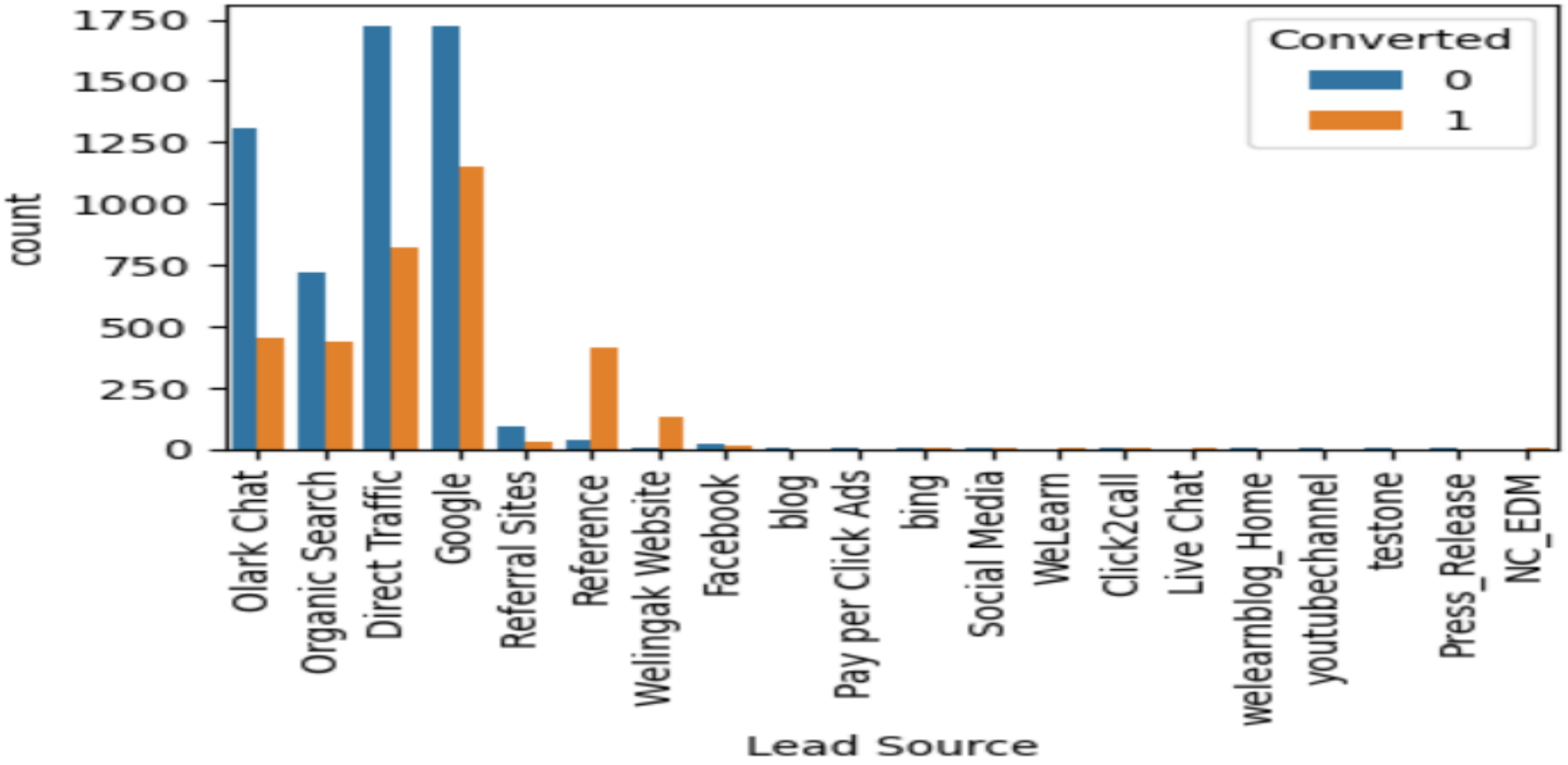




People spending more time on website are more likely to get converted

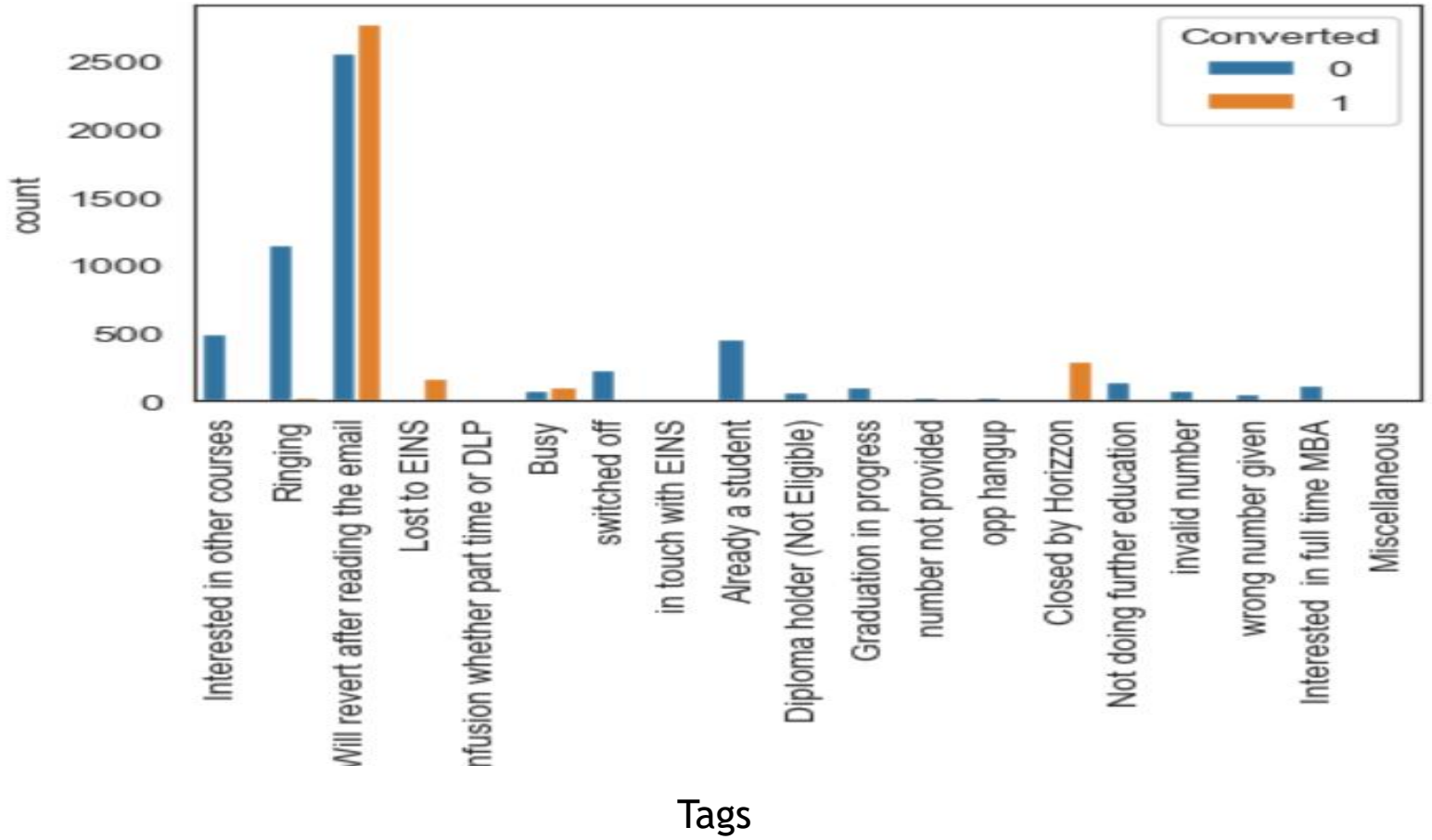


'**API**' and '**Landing page submission**' generate the most leads but have less conversion rates, whereas '**Lead add form**' generates less leads but conversion rate is high.



* High conversion rate for lead sources '**Reference**' and '**Welingak Website**'.

* Most of the leads are genearated through '**Direct Traffic**' and '**Google**'.



Tags like '**Will revert after reading the email**', '**Busy**', and '**Closed by Horizzon**' show high conversion rates, indicating engaged leads. Strategic follow-ups can maximize their conversion potential.

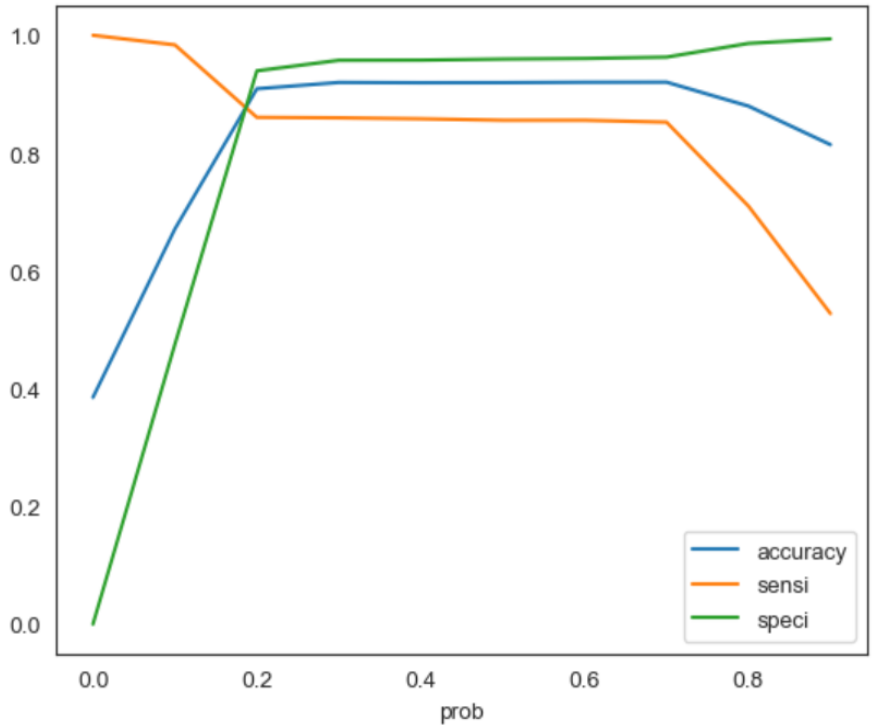
Model Evaluation

Generalized Linear Model Regression Results

Dep. Variable:	Converted	No. Observations:	6351
Model:	GLM	Df Residuals:	6338
Model Family:	Binomial	Df Model:	12
Link Function:	Logit	Scale:	1.0000
Method:	IRLS	Log-Likelihood:	-1611.4
Date:	Mon, 16 Dec 2024	Deviance:	3222.8
Time:	11:02:30	Pearson chi2:	2.61e+04
No. Iterations:	8	Pseudo R-squ. (CS):	0.5620
Covariance Type:	nonrobust		

	coef	std err	z	P>|z|	[0.025	0.975]
const	-2.1838	0.216	-10.106	0.000	-2.607	-1.760
Lead Origin_Lead Add Form	1.0856	0.361	3.006	0.003	0.378	1.794
Lead Source_Welingak Website	3.3105	0.811	4.080	0.000	1.720	4.901
What is your current occupation_Working Professional	1.2699	0.282	4.506	0.000	0.718	1.822
Tags_Busy	3.8972	0.331	11.781	0.000	3.249	4.546
Tags_Closed by Horizzon	8.0859	0.763	10.596	0.000	6.590	9.582
Tags_Lost to EINS	9.2585	0.753	12.294	0.000	7.782	10.735
Tags_Ringing	-1.6717	0.336	-4.979	0.000	-2.330	-1.014
Tags_Will revert after reading the email	4.0114	0.230	17.477	0.000	3.562	4.461
Tags_switched off	-2.3371	0.584	-4.003	0.000	-3.481	-1.193
Lead Quality_Not Sure	-3.3829	0.128	-26.455	0.000	-3.633	-3.132
Lead Quality_Worst	-3.8266	0.842	-4.547	0.000	-5.476	-2.177
Last Notable Activity_SMS Sent	2.7506	0.119	23.137	0.000	2.518	2.984

Finding Optimal Threshold



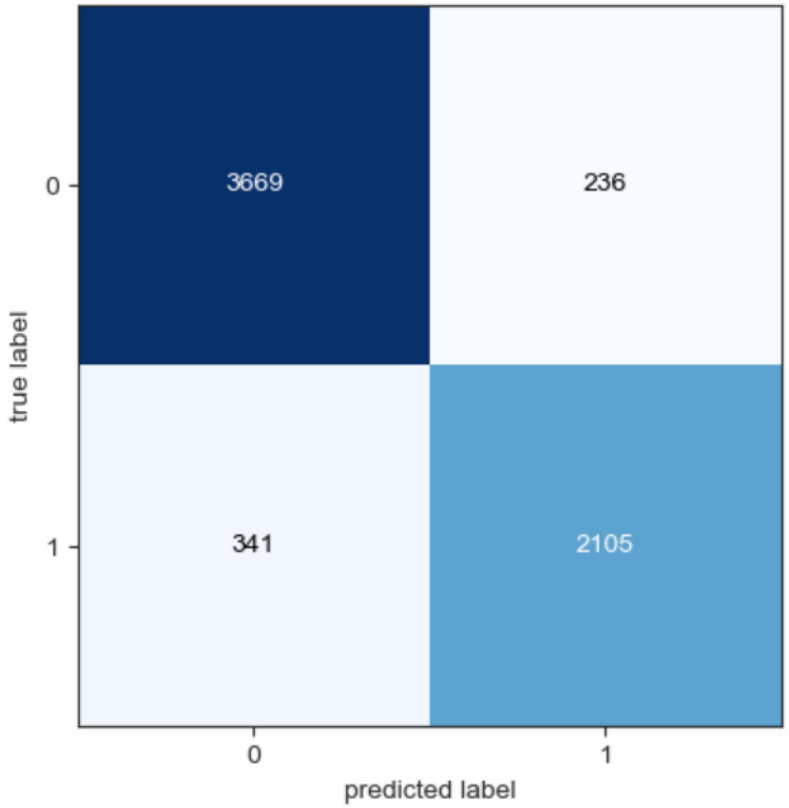
optimal cutoff = 0.20

Graph showing the changes in **Sensitivity**, **Specificity**, and **Accuracy** with varying probability threshold values.

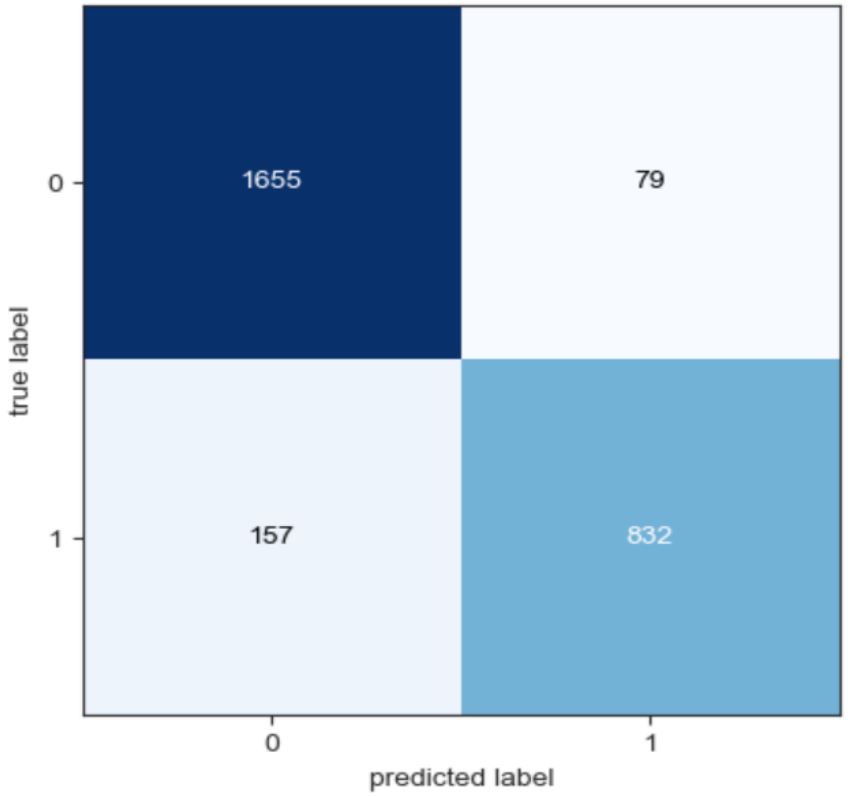
FINAL RESULTS

Data	Train Set	Test Set
Accuracy	0.9091	0.9133
Sensitivity	0.8605	0.8412
Specificity	0.9395	0.9544
False Positive Rate	0.0604	0.0455
Positive Predictive Value	0.8991	0.9132
Negative Predictive Value	0.9149	0.9133
AUC	0.9461	0.9372

CONFUSION MATRIX

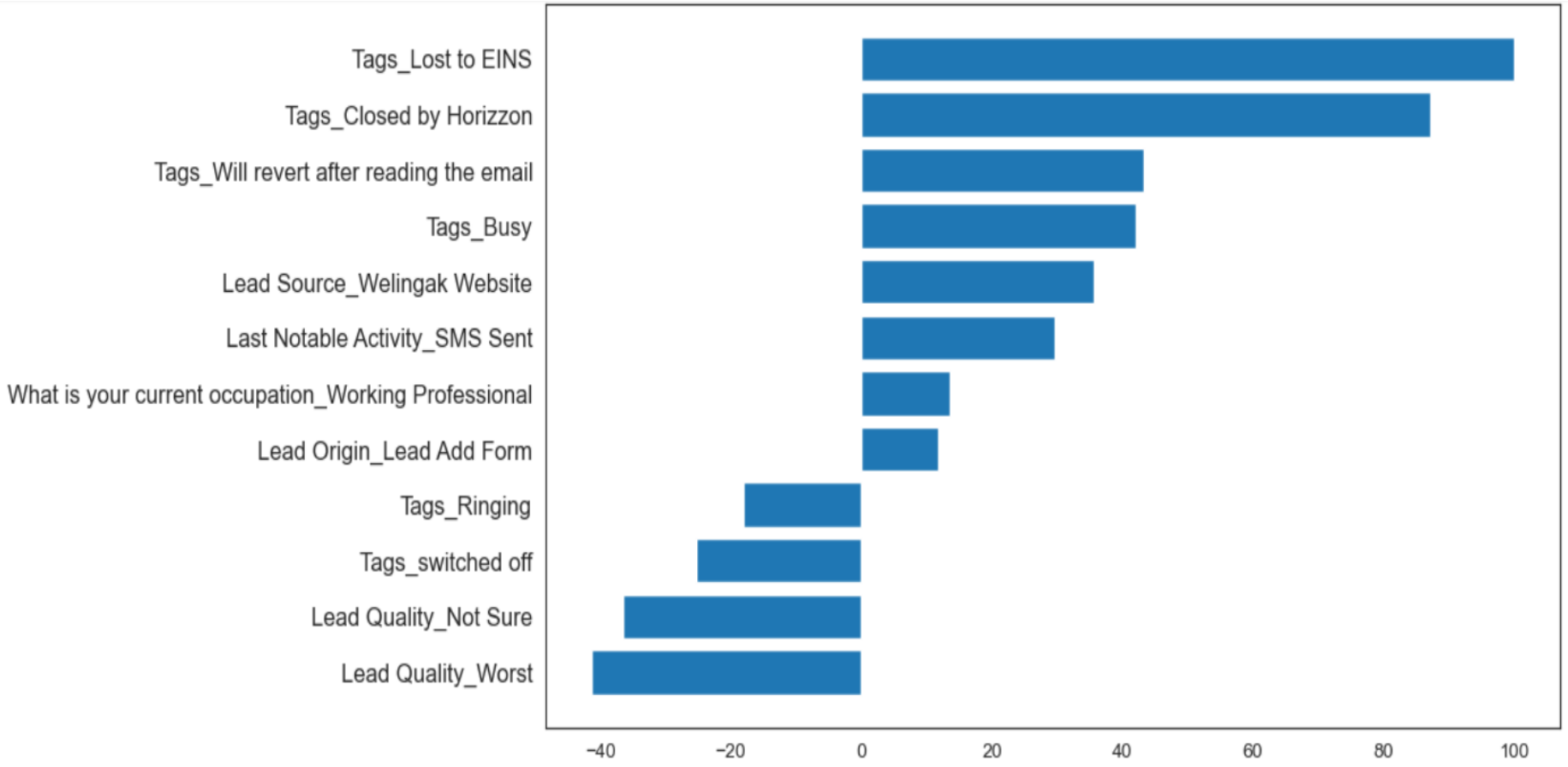


For Train Set



For Test Set

Relative Importance Of Features



RECOMMENDATIONS

- Leads with a high score can be classified as ‘hot’ leads and should be prioritized by the sales team, as they have a high likelihood of conversion.
- Leads categorized as ‘Might Be’ or ‘Worst’ based on past interactions can be deprioritized, as their conversion potential is minimal.
- Leads who have shared their contact numbers through the website or email but are marked as ‘Busy’ or ‘Ringing’ (i.e., not answering calls) should also be considered lower priority and can be ignored, as they are less likely to engage or convert as customers.


Thank
You