LEAD SCORING CASE STUDY

By : Vipul Pithadiya

Problem Statement

- X Education sells online courses to industry professionals.
- Despite receiving a high volume of leads, X Education's conversion rate is low. For example, if they generate 100 leads in a day, only around 30 of them will convert.
- To improve efficiency, the organization aims to discover high-potential leads, or 'Hot Leads'.
- Identifying these leads can increase lead conversion rates since the sales staff can focus on connecting with them instead of calling everyone.

Business Objective

- X Education seeks to identify the most promising leads and develop a model to do so.
- Developed the model for future use.

Methodology for Solving

- Data cleanup and manipulation.

- Check and manage duplicate data.
- Check and handle NA and missing values.
- Drop columns that contain a substantial number of missing values and are useless for the analysis.
- If necessary, the values will be imputed.
- Check for and handle outliers in data.

- Univariate data analysis includes value counts and variable distributions, among other things.
- Bivariate data analysis includes correlation coefficients

EDA

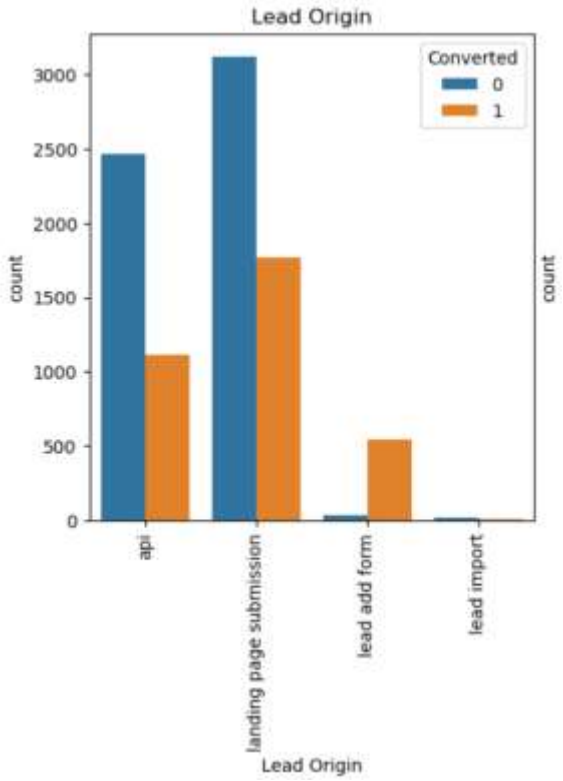
- Feature Scaling and Dummy variables and data encoding.
- Logistic regression is the classification approach used to create and predict models.
- Model validation, presentation, and recommendations.

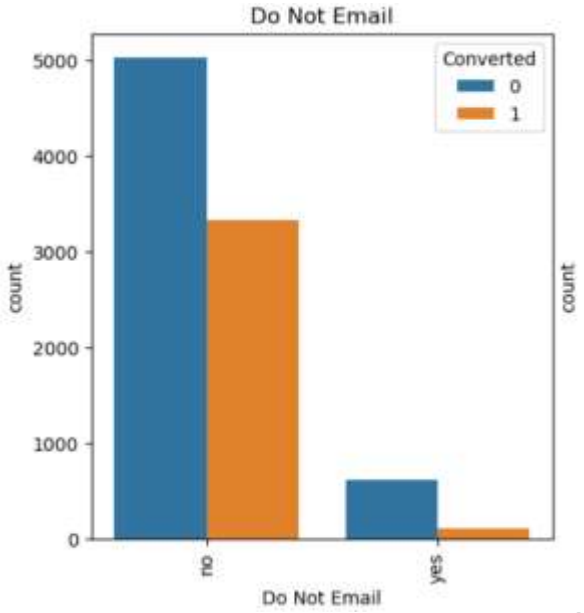
Data Manipulation

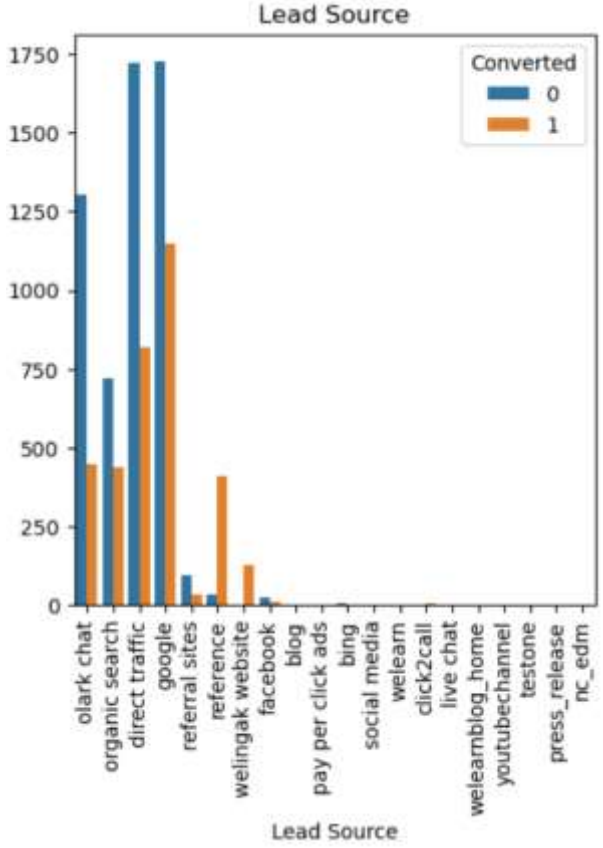
- Total rows = 37, total columns = 9240.
- Single value features include "Magazine," "Receive More Updates About Our Courses," and "Update me on Supply."
- "Chain Content," "Get updates on DM Content," and "I agree to pay the amount through cheque" have been removed.
- Removed unnecessary "Prospect ID" and "Lead Number" fields for analysis.
- Object type variables with insufficient variance were removed, including "Do Not Call," "What matters most to you in choosing a course," "Search," "Newspaper Article," "X Education Forums," "Newspaper," and "Digital Advertisement."
- Dropping columns with more than 35% missing values, such as 'How did you hear about X Education' and 'Lead Profile'.

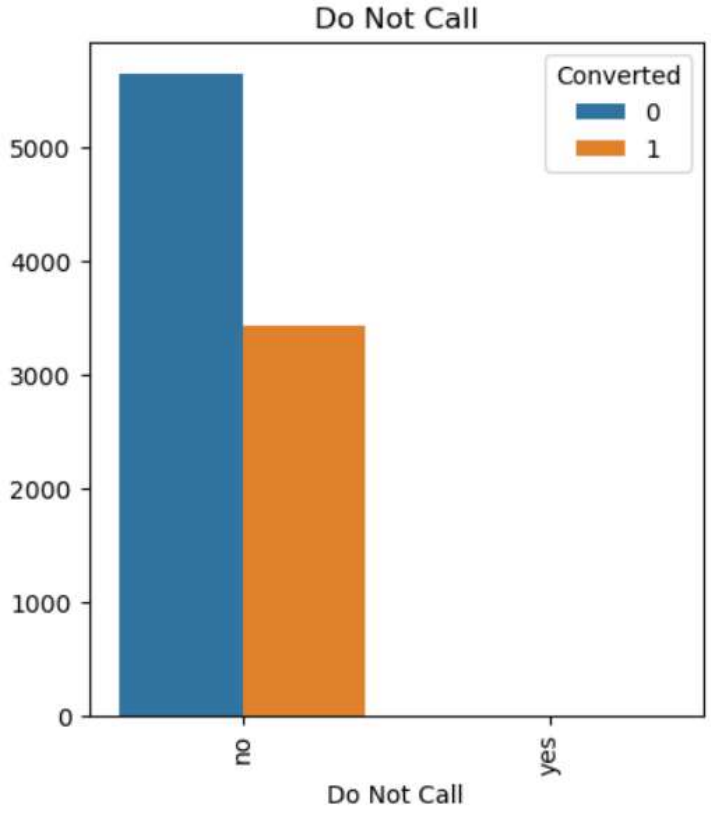
EDA

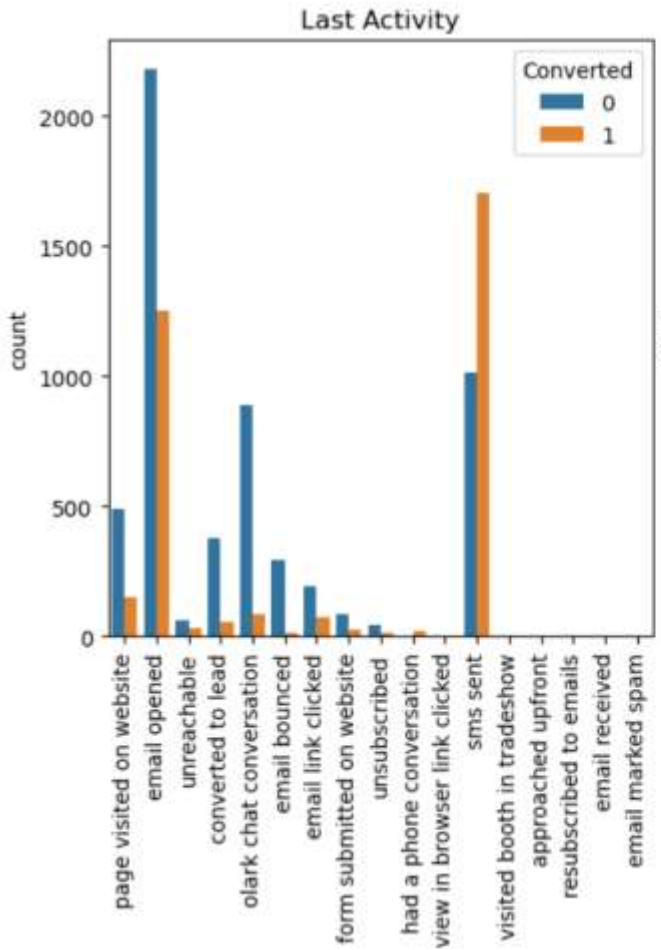
Categorical Variable Relation

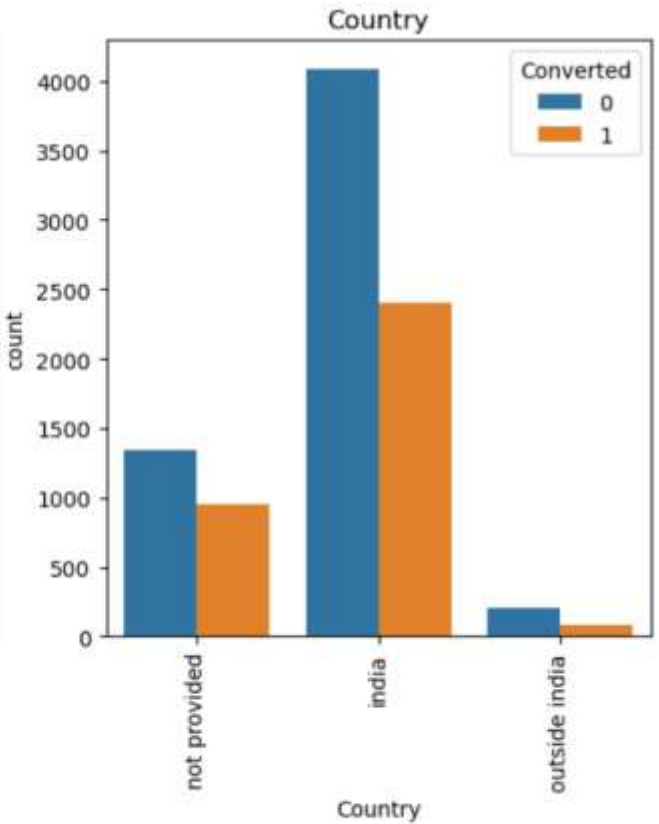





Lead Source
Converted
0
1
1750
1500
1250
1000
750
500
250
0
olark chat
organic search
direct traffic
google
referral sites
reference
welingak website
facebook
blog
pay per click ads
bing
social media
welearn
click2call
live chat
welearnblog_home
youtubechannel
testone
press_release
nc_edm
Lead Source


Do Not Call
Converted
0
1
5000
4000
3000
2000
1000
0
no
yes
Do Not Call


Last Activity
Converted
0
1
count
2000
1500
1000
500
0
page visited on website
email opened
unreachable
converted to lead
olark chat conversation
email bounced
email link clicked
form submitted on website
unsubscribed
had a phone conversation
view in browser link clicked
sms sent
visited booth in tradeshow
approached upfront
resubscribed to emails
email received
email marked spam


Country
Converted
0
1
count
4000
3500
3000
2500
2000
1500
1000
500
0
not provided
india
outside india
Country

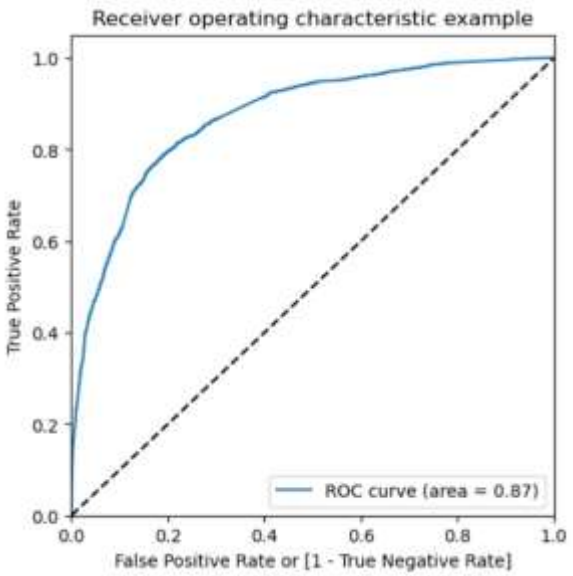
Data Conversion

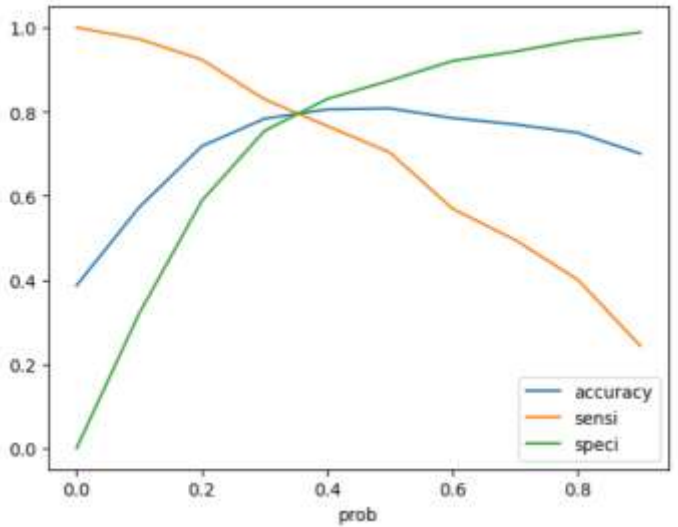
- Numerical Variables are Normalised
- Dummy Variables are created for object type variables
- Total Rows for Analysis: 8792
- Total Columns for Analysis: 43

Model Building

- The first stage in regression is to partition the data into training and testing sets. We used a train-test ratio of 70:30.
- Use RFE for feature selection.
- Run RFE with 15 variables as output.
- Build model by deleting variables with p-value > 0.05 and vif > 5.
- Made predictions on test data set with 81% accuracy.

ROC Curve





Finding the Optimal Cut-off Point

The ideal cut off probability is 0.35, which provides balanced sensitivity and specificity, as shown in the second graph.

Conclusion

It was found that the variables that mattered the most among the potential buyers are:

- The total time spend on the Website.
- Total number of visits.
- When the lead source was:
  - Google
  - Direct traffic
  - Organic search
  - Welingak website
- When the last activity was:
  - SMS
  - Olark chat conversation
- When their current occupation is as a working professional.

With this in mind, X Education can grow since they have a great possibility of persuading nearly every prospective customer to change their mind and enroll in their courses.