

Lead Score Case study

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Problem statement

- X Education sells online courses to industry professionals.
- X Education gets a lot of leads, its lead conversion rate is very poor. For example, if, say, they acquire 100 leads in a day, only about 30 of them are converted.
- To make this process more efficient, the company wishes to identify the most potential leads, also known as 'Hot Leads'.
- If they successfully identify this set of leads, the lead conversion rate should go up as the sales team will now be focusing more on communicating with the potential leads rather than making calls to everyone

Business Objective

- X education wants to know most promising leads.
- For that they want to build a Model which identifies the hot leads.
- Deployment of the model for the future use.

Solution Methodolog y

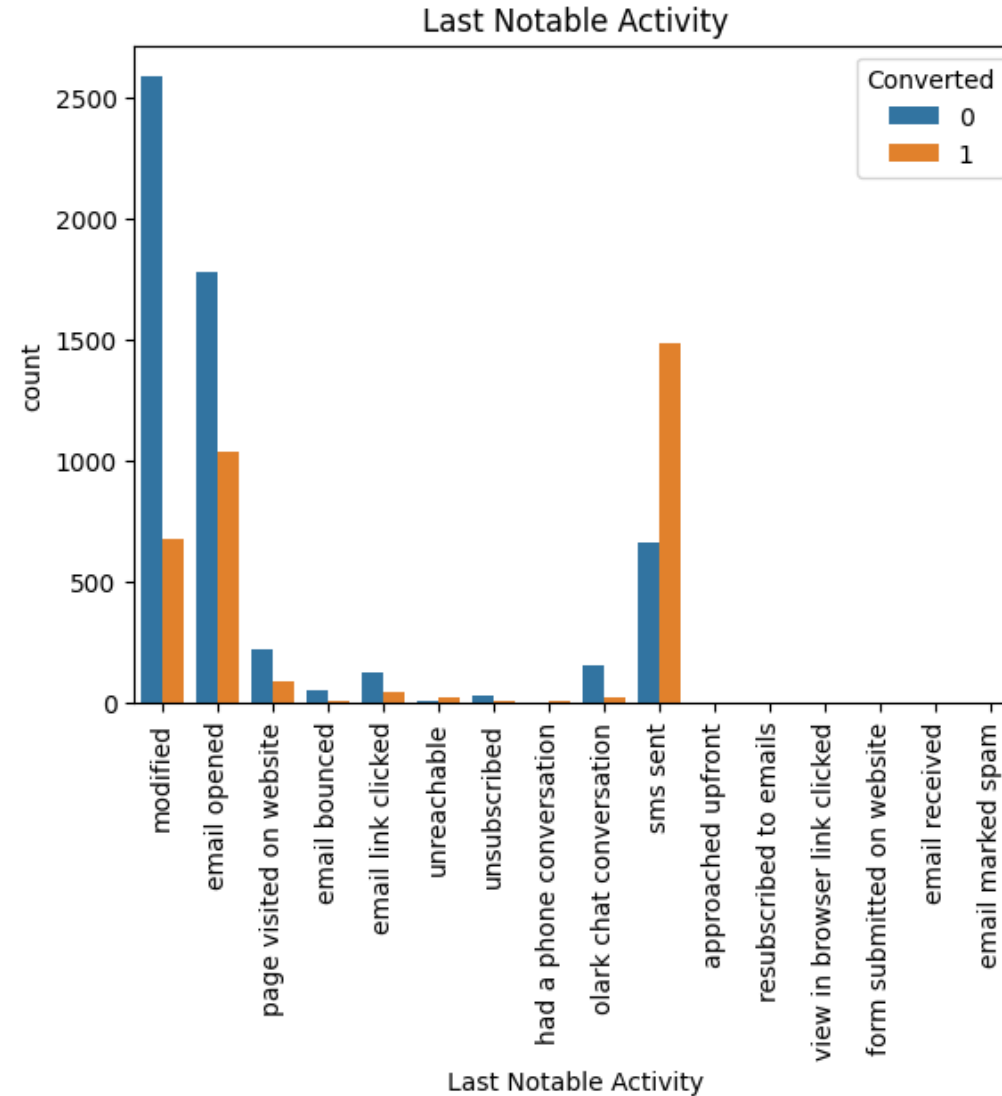
- ▢ Data cleaning and data manipulation.
 1. Check and handle duplicate data.
 2. Check and handle NA values and missing values.
 3. Drop columns, if it contains large amount of missing values and not useful for the analysis.
 4. Imputation of the values, if necessary.
 5. Check and handle outliers in data.
- ▢ EDA
 1. Univariate data analysis: value count, distribution of variable etc.
 2. Bivariate data analysis: correlation coefficients and pattern between the variables etc.
- ▢ Feature Scaling & Dummy Variables and encoding of the data.
- ▢ Classification technique: logistic regression used for the model making and prediction.
- ▢ Validation of the model.
- ▢ Model presentation.
- ▢ Conclusions and recommendations.

Data Manipulation

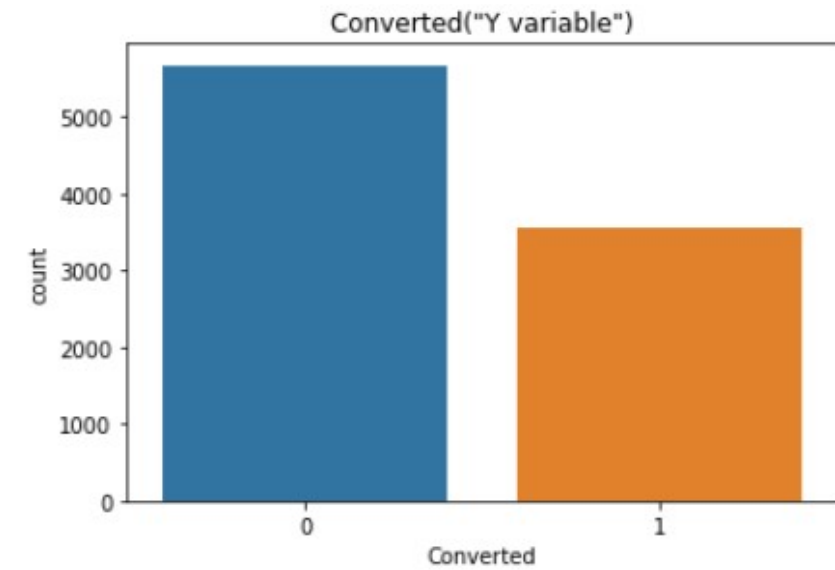
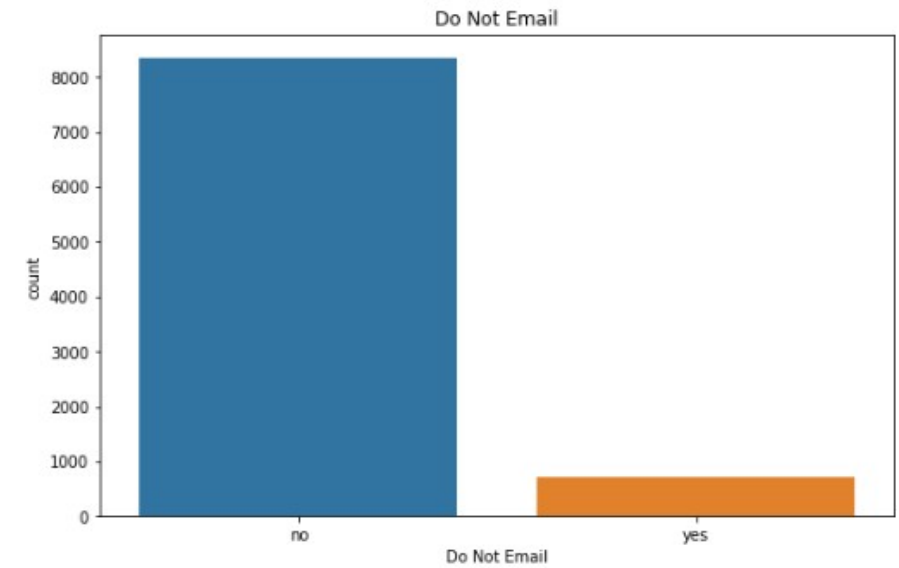
- ▮ Total Number of Rows =37, Total Number of Columns =9240.
- ▮ Single value features like “Magazine”, “Receive More Updates About Our Courses”, “Update me on Supply”
- ▮ Chain Content”, “Get updates on DM Content”, “I agree to pay the amount through cheque” etc. have been dropped.
- ▮ Removing the “Prospect ID” and “Lead Number” which is not necessary for the analysis.
- ▮ After checking for the value counts for some of the object type variables, we find some of the features which has no enough variance, which we have dropped, the features are: “Do Not Call”, “What matters most to you in choosing course”, “Search”, “Newspaper Article”, “X Education Forums”, “Newspaper”, “Digital Advertisement” etc.
- ▮ Dropping the columns having more than 35% as missing value such as ‘How did you hear about X Education’ and ‘Lead Profile’.

EDA

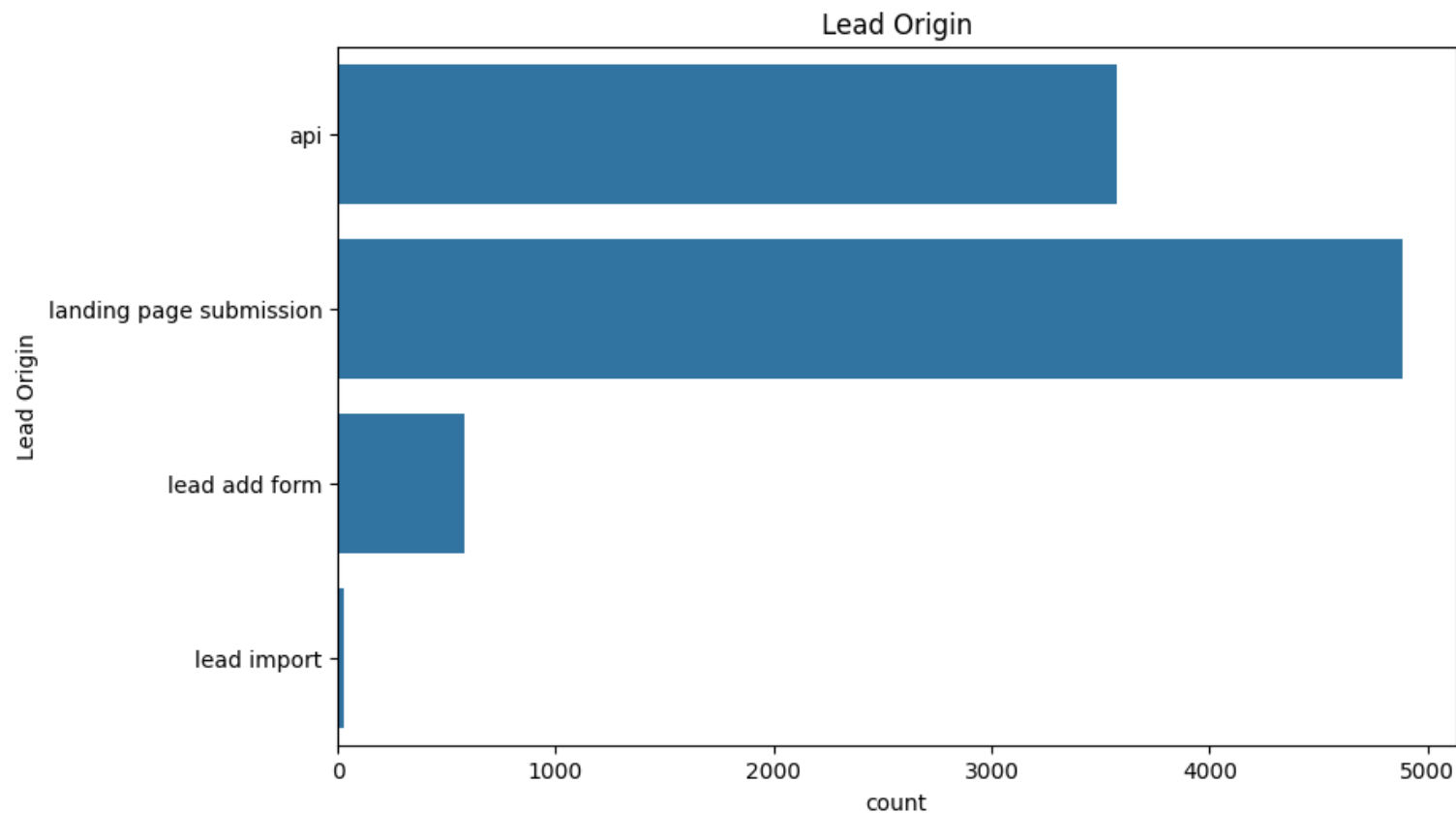
After the analysis we can see that while Modified is the most common activity, it does not lead to many conversions. On the other hand, SMS Sent, Olark Chat Conversation, and Email Link Clicked seem to be more effective in leading to conversions. Therefore, focusing on these activities could potentially increase the overall conversion rate.



Email appears to be an acceptable form of communication for the majority, it's important to consider the preferences of all individuals or entities and explore other communication channels where appropriate.

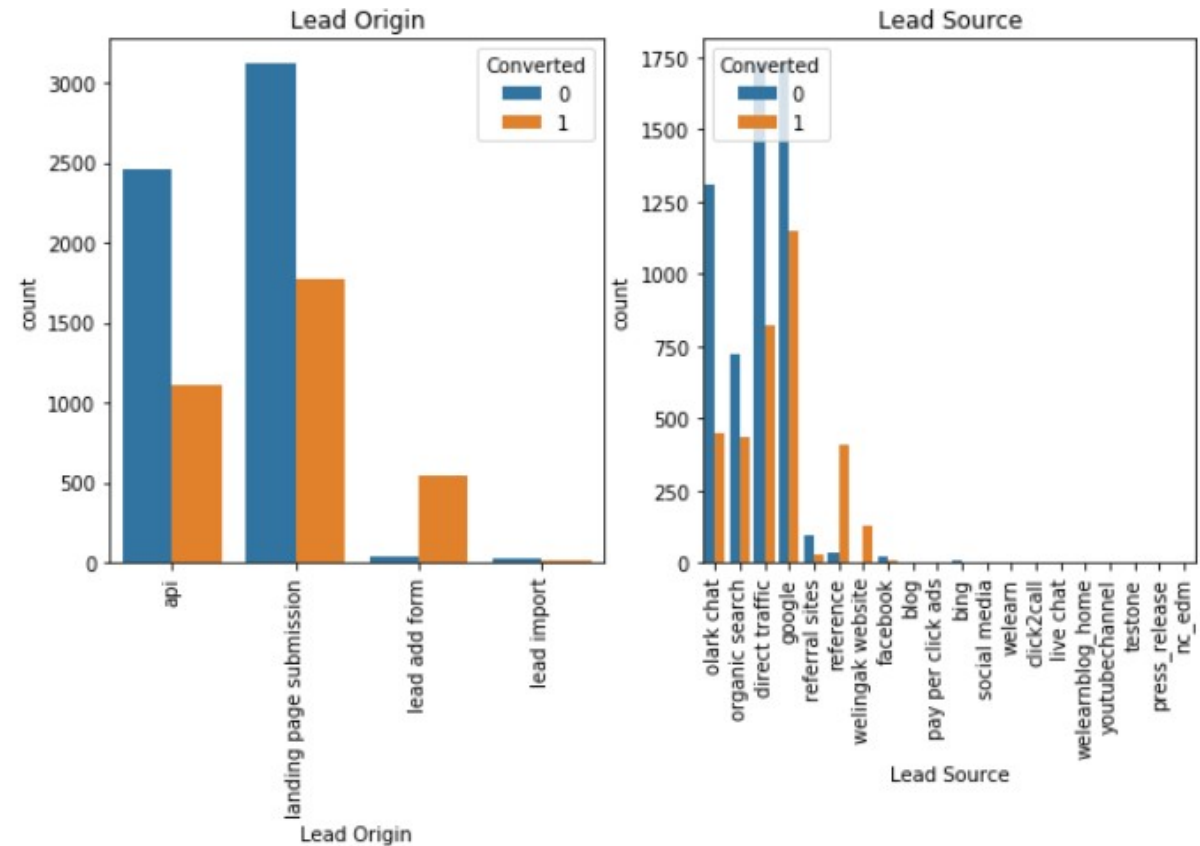


“Landing Page Submission” and “API” appear to be the most effective channels for lead generation in this particular context. However, the effectiveness of a channel can depend on various factors, and it’s important to consider these factors when interpreting these results. Further analysis would be needed to draw more concrete conclusions

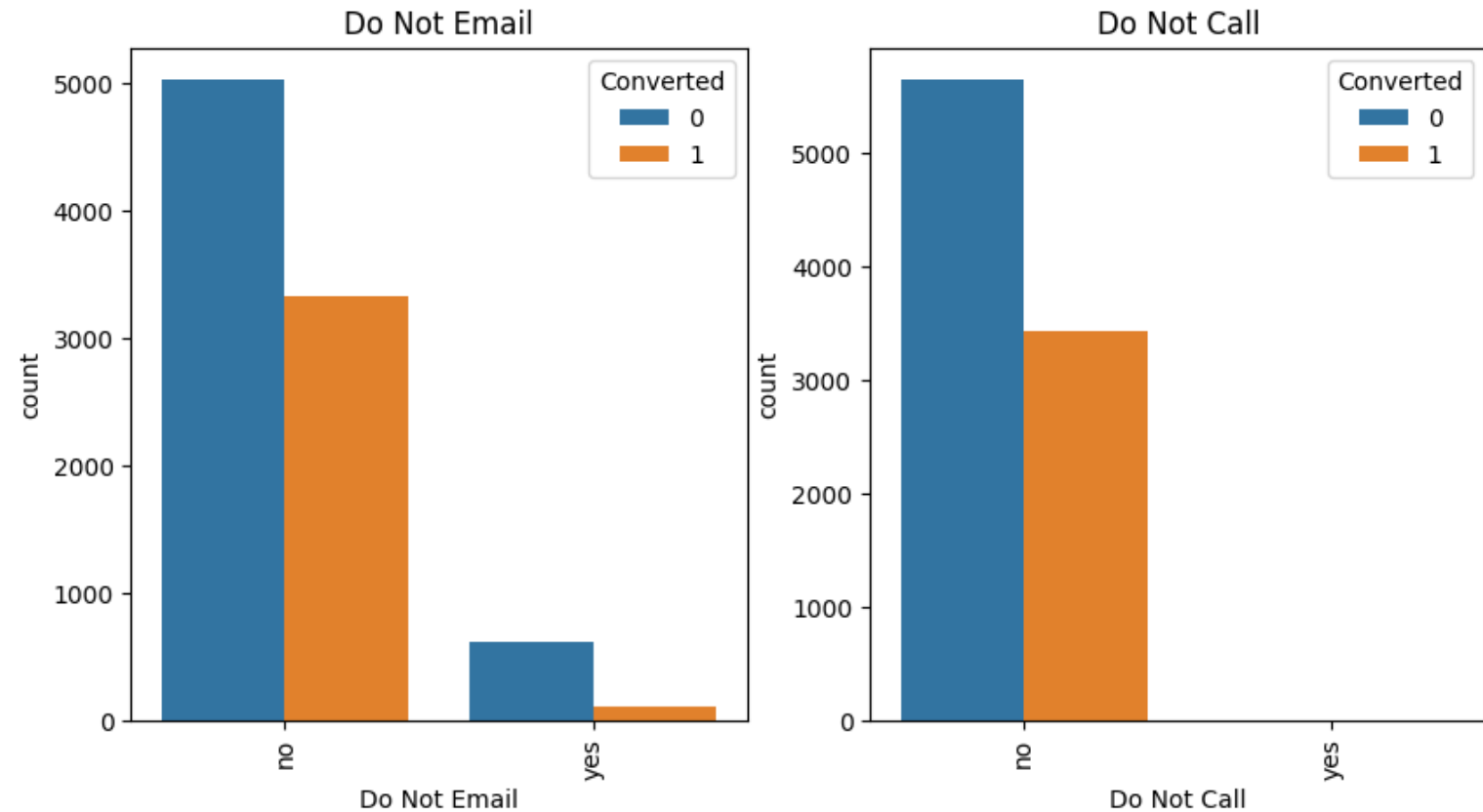


Categorical Variable Relation

the number of leads is important, the conversion rate is also a crucial factor to consider. Therefore, strategies like improving the API and focusing on Google as a lead source could potentially increase the overall conversion rate. However, further analysis would be needed to confirm these insights and to understand the underlying reasons

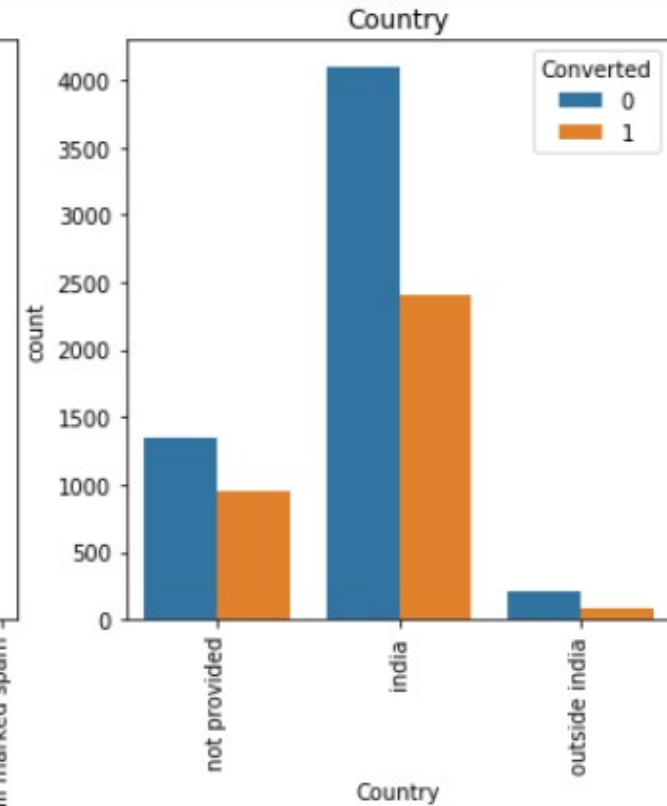
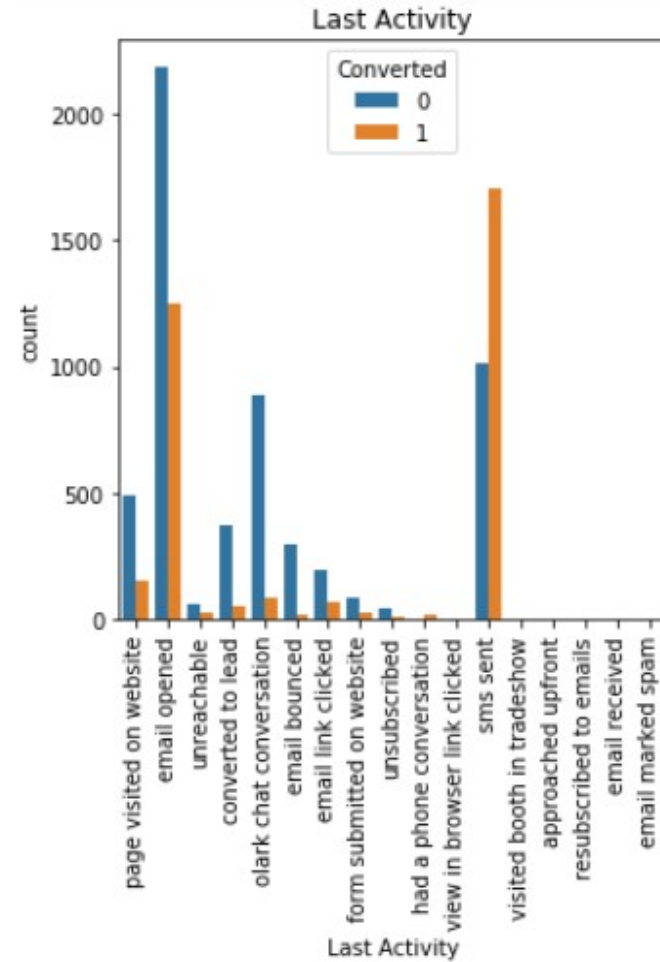


majority of customers prefer not to be emailed or called, those who do opt out are more likely to convert. This could suggest that respecting the customer's communication preferences can lead to higher conversion rates



Last Activity: The highest conversion rate is observed for users whose last activity was “SMS Sent”. This suggests that sending SMS might be an effective strategy for increasing conversions.

Country: Most users are from India, but the conversion rate is higher for users outside India. This could indicate a need to improve strategies to increase conversion rates within India or focus on international markets.



Data Conversion

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

ModelBuilding

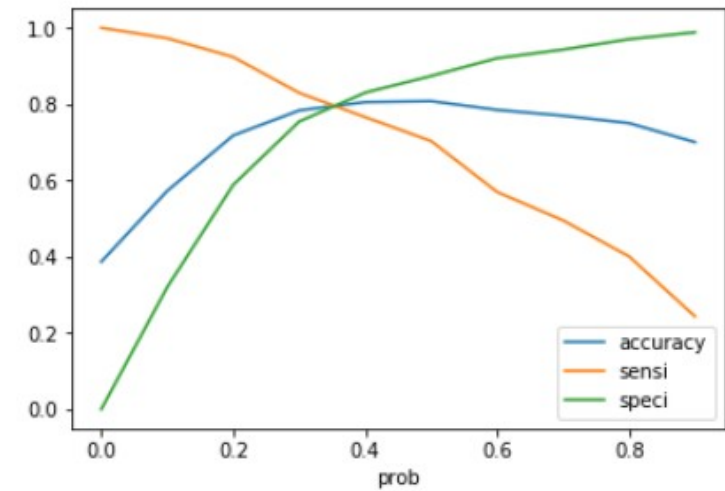
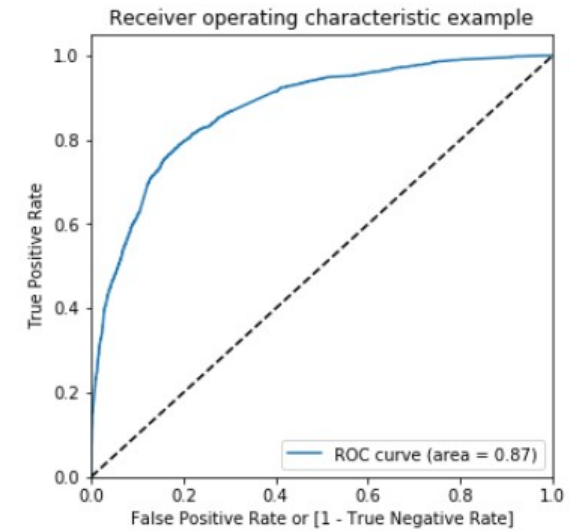
- ▮ Splitting the Data into Training and Testing Sets
- ▮ The first basic step for regression is performing a train-test split, we have chosen 70:30 ratio.
- ▮ Use RFE for Feature Selection
- ▮ Running RFE with 15 variables as output
- ▮ Building Model by removing the variable whose p-value is greater than 0.05 and vifvalue is greater than 5
- ▮ Predictions on test data setOverall accuracy 81%

ROC Curve

Finding Optimal Cut off Point

Optimal cut off probability is that probability where we get balanced sensitivity and specificity.

From the second graph it is visible that the optimal cut off is at 0.35



Conclusion

It was found that the variables that mattered the most in the potential buyers are (In descending order) :

- ▢ The total time spend on the Website.
- ▢ Total number of visits.
- ▢ When the lead source was:
 - a. Google
 - b. Direct traffic
 - c. Organic search
 - d. Welingakwebsite
- ▢ When the last activity was:
 - a. SMS
 - b. Olark chat conversation
- ▢ When the lead origin is Lead add format.
- ▢ When their current occupation is as a working professional.Keeping these in mind the X Education can flourish as they have a very high chance to get almost all the potential buyers to change their mind and buy their courses.