

# Summary

X Education gets a lot of leads, its lead conversion rate is very poor at around 30%. The company requires us to build a model wherein we need to assign a lead score to each of the leads such that the customers with a higher lead score have higher conversion chance.

CEO's target for lead conversion rate is around 80%.

## *Data Cleaning:*

- Columns with >40% nulls were dropped. Value counts within categorical columns were checked to decide appropriate action:
- Numerical categorical data were imputed with mode and columns with only one unique response from customer were dropped.

## *EDA:*

- Data imbalance checked- only 38.5% leads converted.
- Performed univariate and bivariate analysis for categorical and numerical variables. 'Lead Origin', 'Current occupation', 'Lead Source', etc. provide valuable insight on effect on target variable.
- Time spend on website shows positive impact on lead conversion.

## *Data Preparation:*

- Created dummy features (one-hot encoded) for categorical variables
- Splitting Train & Test Sets: 70:30 ratio
- Feature Scaling using Standardization
- Dropped few columns, they were highly correlated with each other

## *Model Building:*

- Used RFE to reduce variables from 48 to 15. This will make dataframe more manageable.
- Manual Feature Reduction process was used to build models by dropping variables with p-value > 0.05.
- Total 3 models were built before reaching final Model 4 which was stable with (p-values < 0.05). No sign of multicollinearity with VIF < 5.
- logm4 was selected as final model with 12 variables, we used it for making prediction on train and test set.

## *Model Evaluation:*

- Confusion matrix was made and cut off point of 0.345 was selected based on accuracy, sensitivity and specificity plot. This cut off gave accuracy, specificity and precision all around 80%. Whereas precision recall view gave less performance metrics around 75%.

- As to solve business problem CEO asked to boost conversion rate to 80%, but metrics dropped when we took precision-recall view. So, we will choose sensitivity-specificity view for our optimal cut-off for final predictions
- Lead score was assigned to train data using 0.345 as cut off.

### ***Making Predictions on Test Data:***

- Making Predictions on Test: Scaling and predicting using final model.
- Evaluation metrics for train & test are very close to around 80%.
- Lead score was assigned.
- Top 3 features are:
  - Lead Source\_Welingak Website
  - Lead Source\_Reference
  - Current\_occupation\_Working Professional