Sales Grade Classifier

By: Michael Weber

The Sales Funnel

What is it? How can it be improved?

Focus point: the leads hand-off to salesperson at qualification

The leads are usually given in batches of 30-50 without prioritization.

With ML we can improve the sales process by grading sales leads, to allow for proper prioritization of sales efforts.

Helping sales team prioritize the right leads to make efficient use of their time.

Prospecting/ Lead Generation

Qualification

Proposal
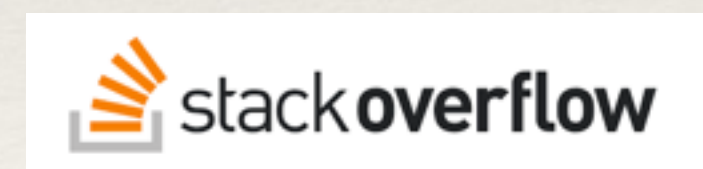
Post Proposal

Commitment

Sale

Data and Tools

Data

Tools

❖ Segmented IBM company sales data

❖ 80k observations

❖ 10 Features including: Location, Sector, Opportunity Amount, Company Size
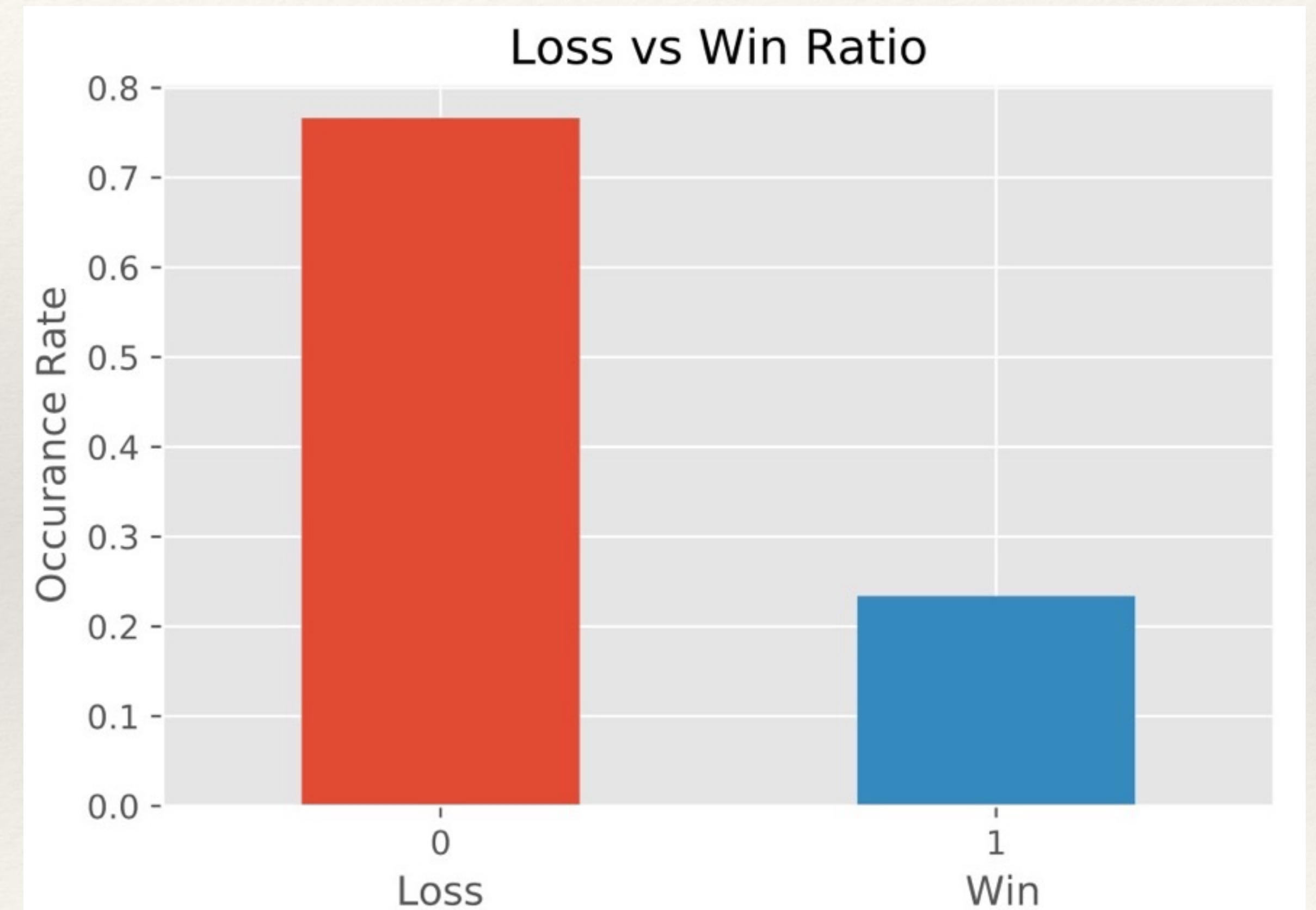
❖ Remove data leakage features: ie Days to close

seaborn

Class Imbalance

❖ Class imbalance success ratio

Loss 77% > Win 23%

❖ Target: **Minimize False Negatives**
predicting a loss when really a win

❖ Oversampling to combat imbalance
using balanced set to train model on more
observations

Modeling

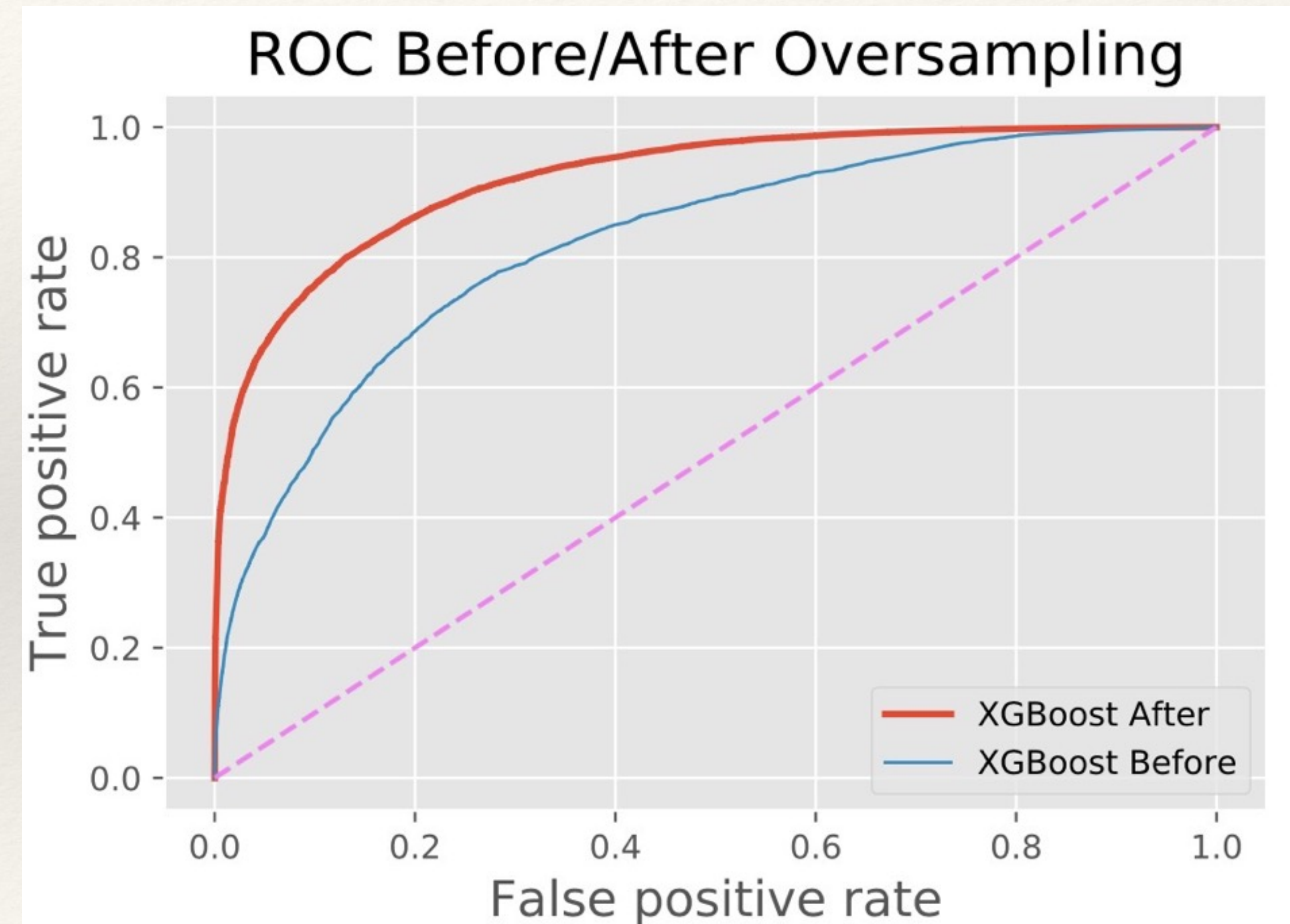You can see the improvement with oversampling in these ROC curves.

XGBoost Classifier Model

❖ Gradient Boosted Decision Tree

Good for:

• Handling of categorical variables

• Robust prediction power with speed

• Reducing Overfitting with Regularization, Bagging, and CV for hyper parameters all built in

Results
Grading Leads = what?

Assumptions:

Sales person to target highest to lowest grade in order, not random.
Saves Time, Increases Win Opportunities, Increases Sales Potential.

Avg sales win = $40k
Avg sales loss = $60k

8 hour workday w/ 30 leads per day = 20 mins per lead
7 of 30 leads are win opps

If grades can better prioritize to say all 7 leads worked first, safe to say improvement will occur.

Per Week

	Time Saved	Win Opps Increased	Potential $$$
1% improvement	25 mins	1	$40k
5% improvement	2 hrs	5	$200k
10% improvement	4 hrs	10	$400k

Future Work

❖ More data

❖ Incorporate leaky data in through suggested action

❖ Web App for individual sales person —>

❖ Automate the whole process distributing graded leads direct to sales staff in real time.

❖ Add decision algorithm for lead distribution based.

Supplies Subgroup
Motorcycle Parts
Supplies Group
Performance & Non-aut
Region
Pacific
Route To Market
Reseller
Opportunity Amount USD
10000
Client Size By Revenue
3
Client Size By Employee Count
3
Revenue From Client Past Two Years
1
Competitor Type
Known
Deal Size Category
3
Submit

Prediction: **68% chance of Win**
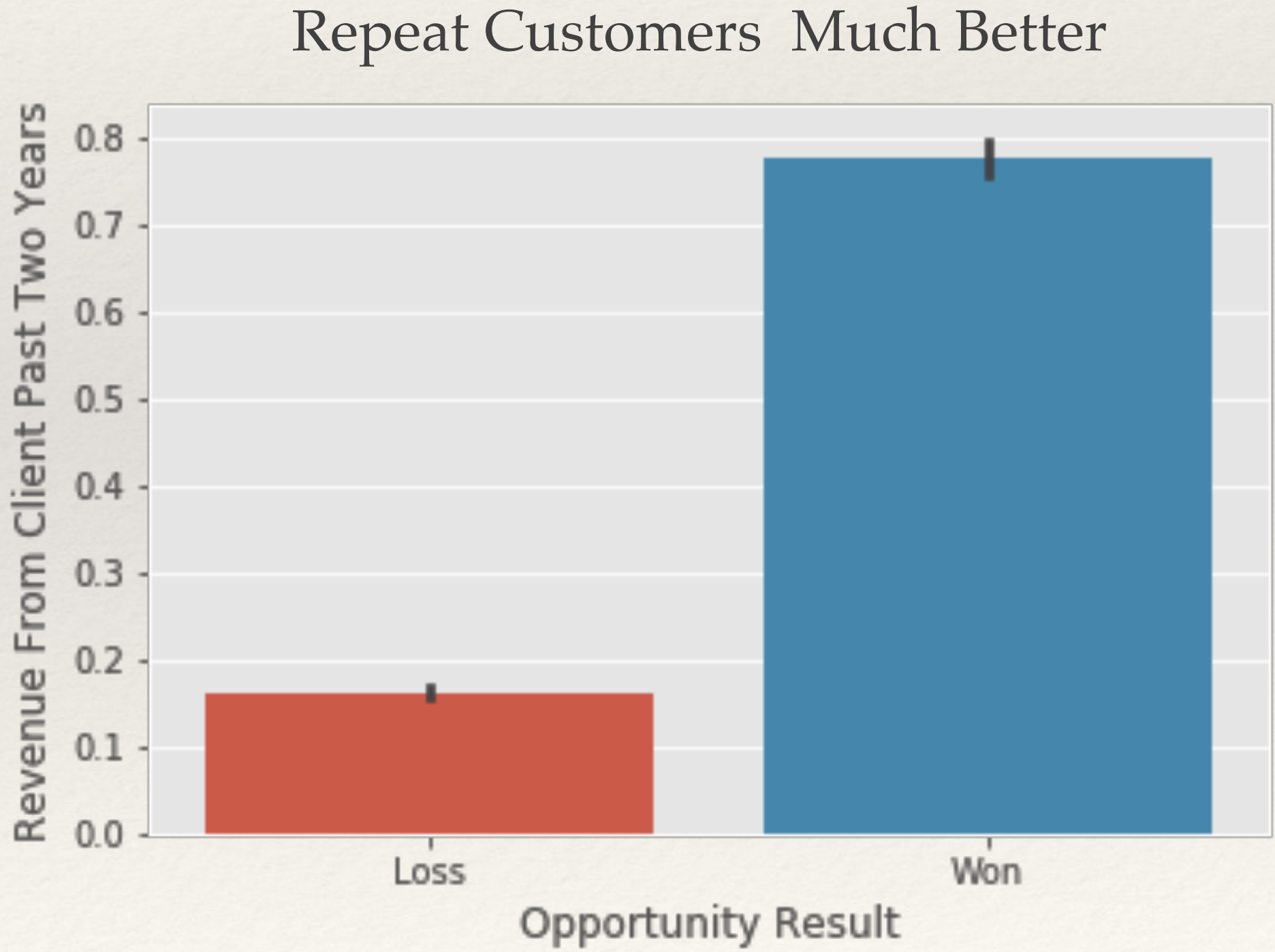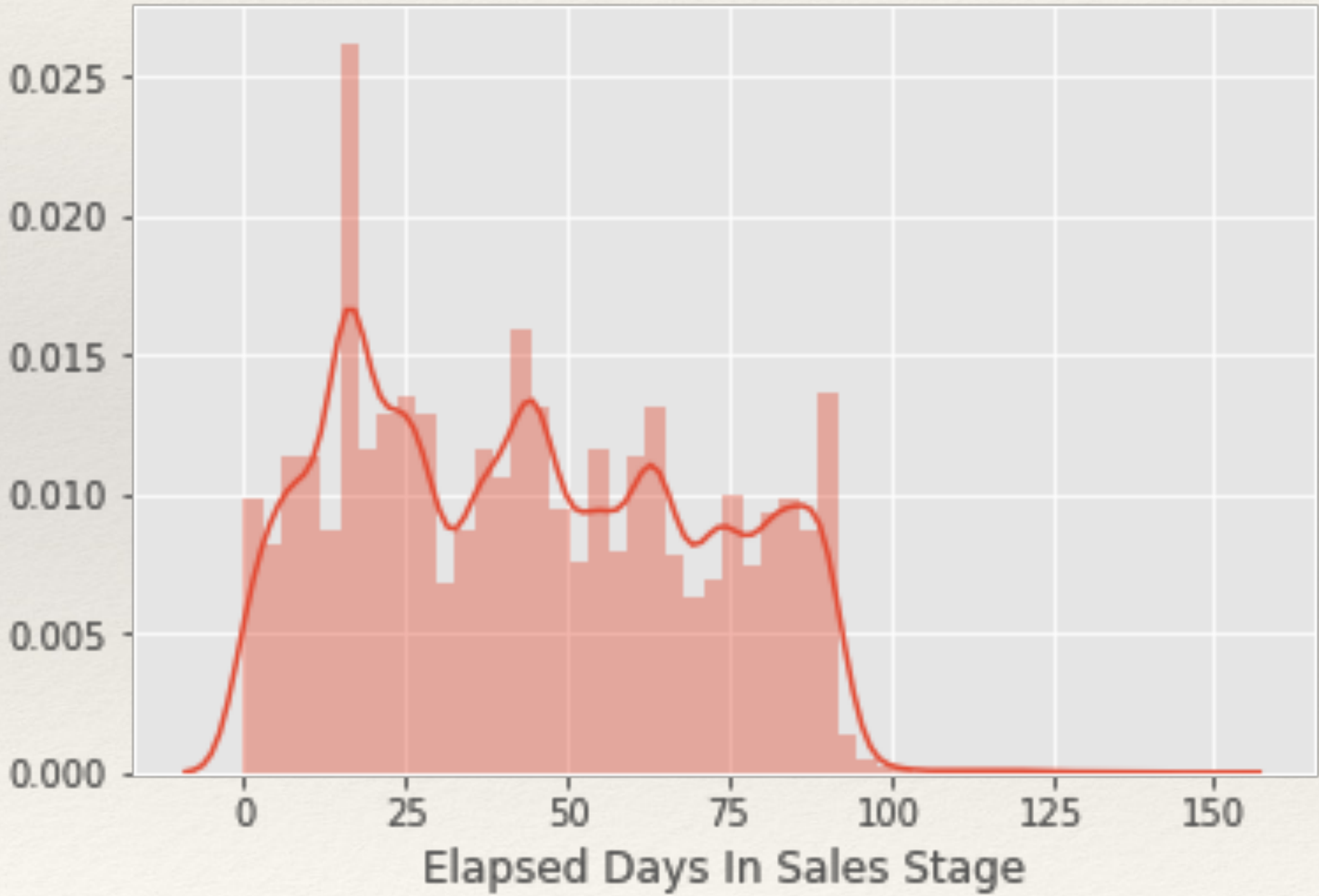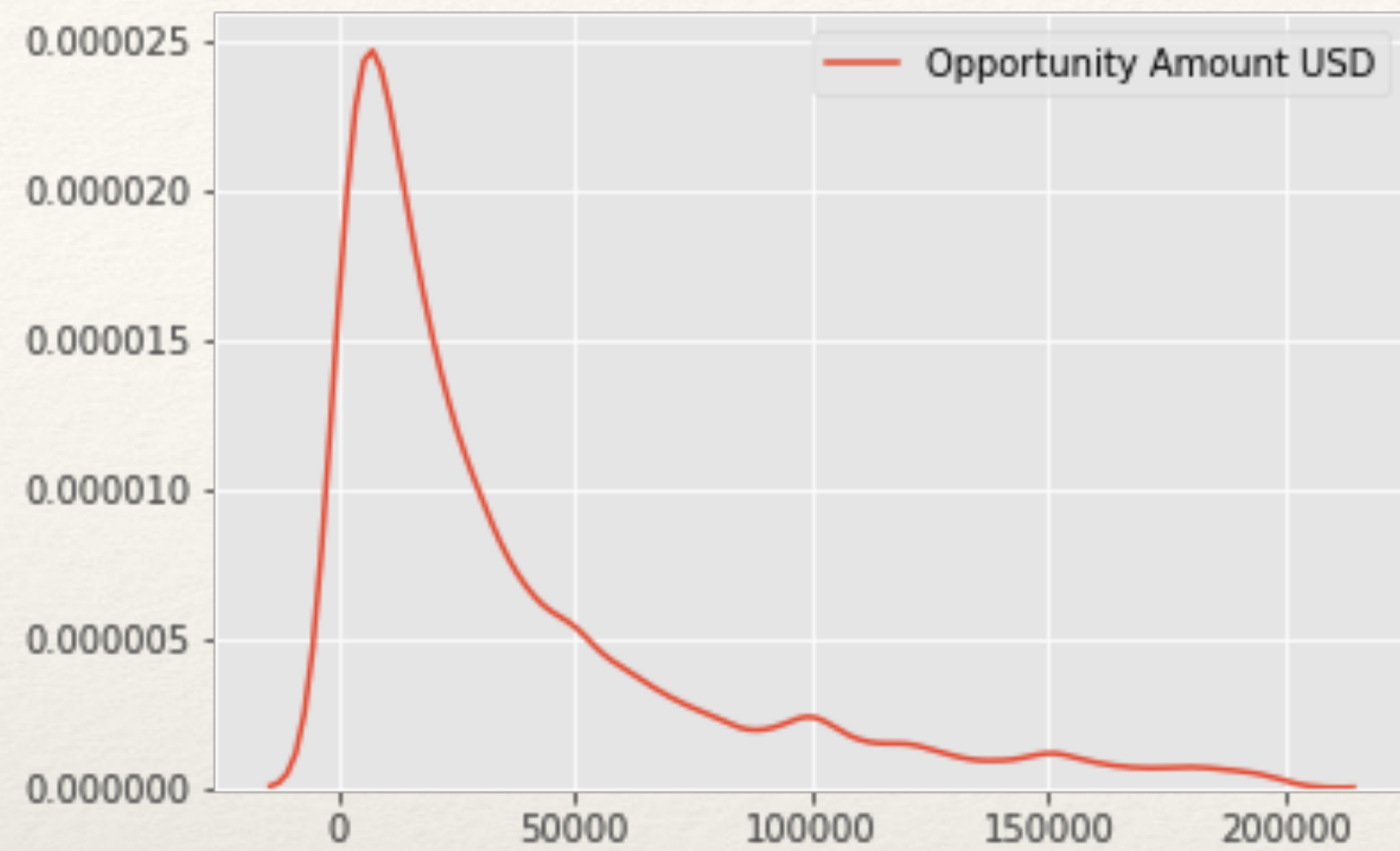**Grade: B**

Thank you

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APPENDIX

| Feature	Mean			
	Won	Loss	Diff	% Diff
Revenue From Client Past Two Years	0.78	0.24	0.54	69%
Opportunity Amount USD	97087	72962	24125.00	25%
Total Days Identified Through Closing	8.59	19.10	-10.52	-122%
Total Days Identified Through Qualified	7.69	18.83	-11.14	-145%
Reseller	0.54	0.42	0.13	23%
Ratio Days Identified To Total Days	0.07	0.24	-0.18	-262%

Repeat Customers Much Better

Won

Loss
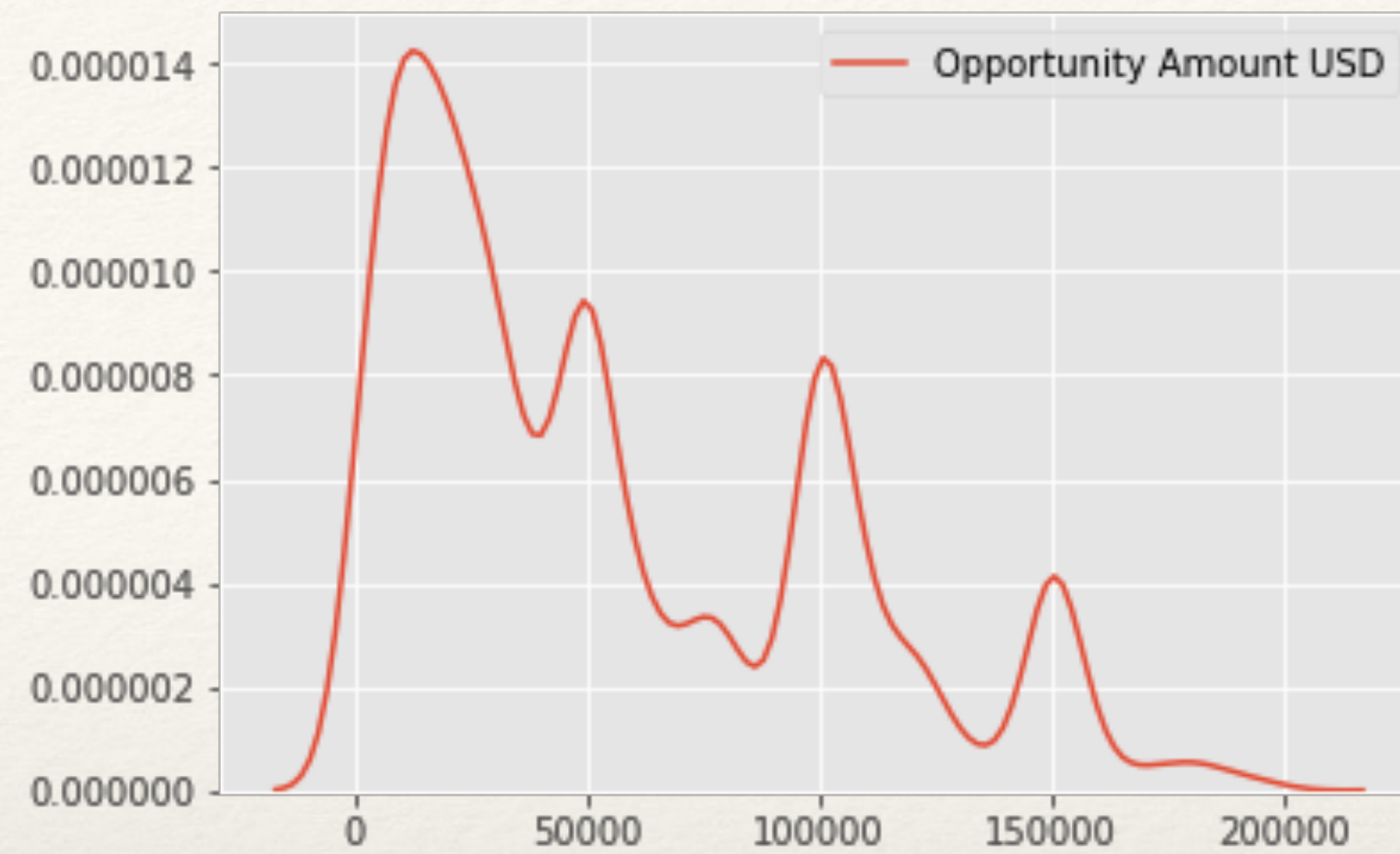
Score the ones you are supposed to?
Or go after those elusive "big fish"?
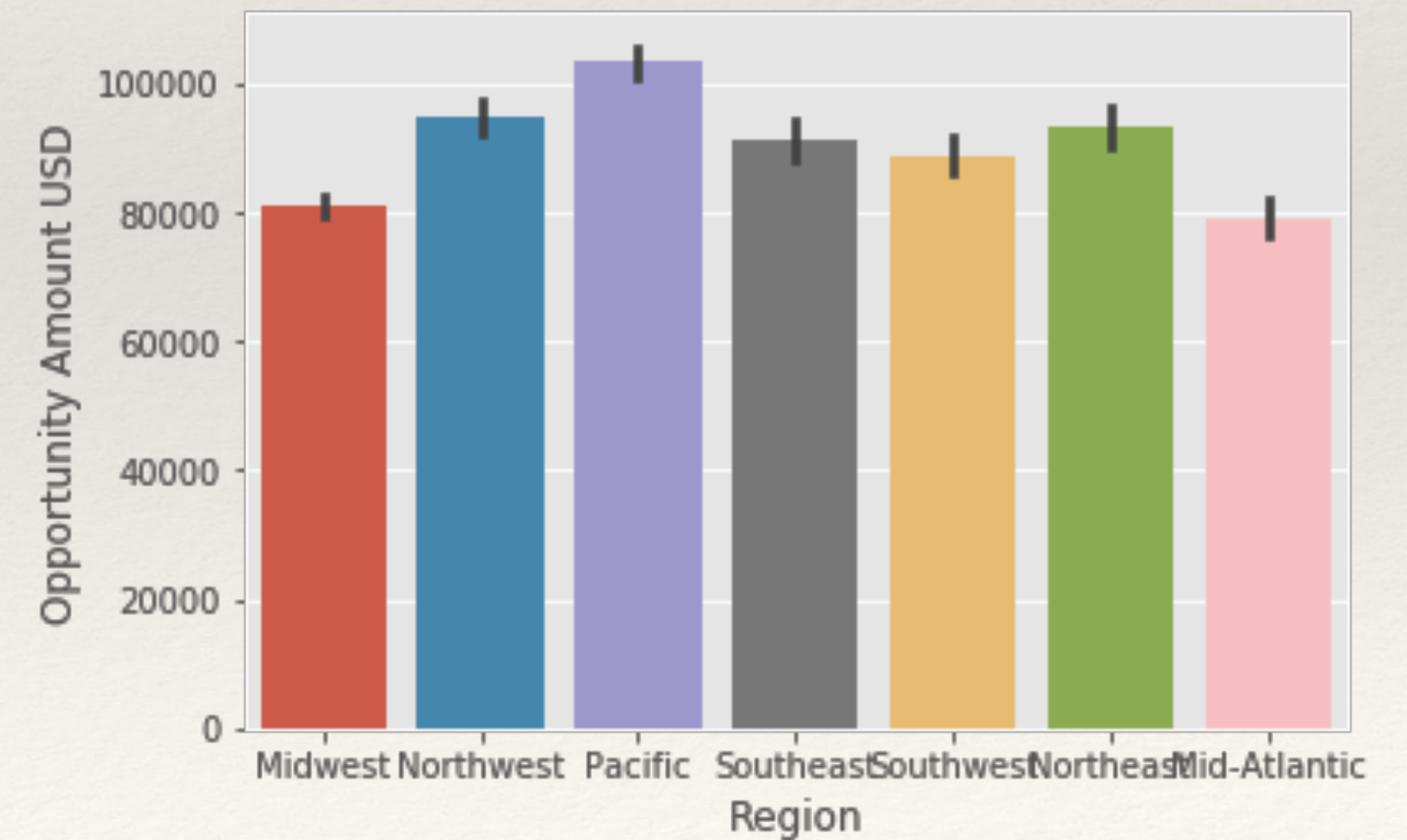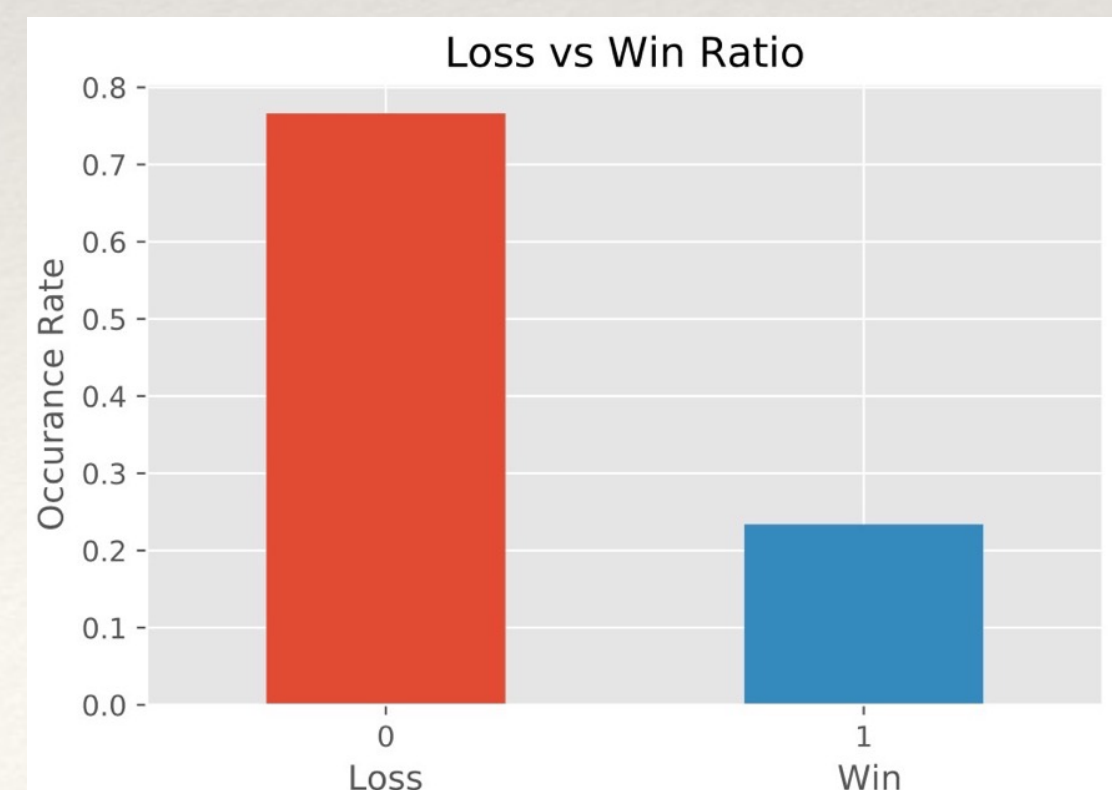
Web App with CatBoost

❖ Grade out based on %

❖ A, B, C, D

Supplies Subgroup

Motorcycle Parts

Supplies Group

Performance & Non-aut

Region

Pacific

Route To Market

Reseller

Opportunity Amount USD

10000

Client Size By Revenue

3

Client Size By Employee Count

3

Revenue From Client Past Two Years

1

Competitor Type

Known

Deal Size Category

3

Submit

Prediction:

68% chance of Win
Grade: B

APPENDIX

XG Boost Classifier with regular data
Precision: 0.7643,   Recall: 0.3110

CatBoost Classifier
Precision: 0.8759,   Recall: 0.5337

XG Boost Classifier with ADASYN data
Precision: 0.8482,   Recall: 0.8178

❖ The key difference between ADASYN and SMOTE is that the former uses a density distribution, as a criterion to automatically decide the number of synthetic samples that must be generated for each minority sample by adaptively changing the weights of the different minority samples to compensate for the skewed distributions.

ROC Before/After Oversampling