

# E-commerce Customer Purchase Intentions

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# Overview

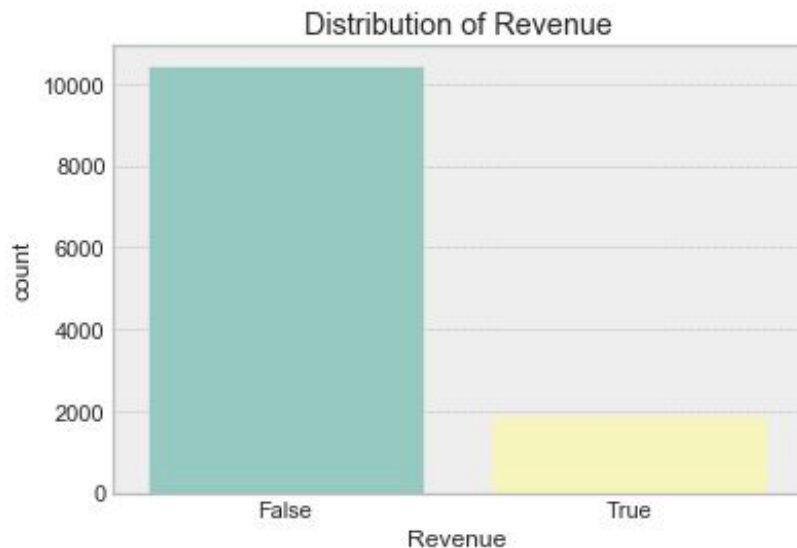
- As e-commerce grows, we want increase purchase likelihood
- Being able to predict sales would be beneficial for any company
- We can create a classification model to determine these predictions
- Looking at our model results, there are clear areas of opportunity



# Business Problem

What are the areas of opportunity to increase conversion among people who visit the website?

- To investigate this, we built a classification model predicting whether a site visitor will purchase the product or not.
- Evaluation Metric: **Recall**



# Business Insights

1. How does the number of visitor differ each months?
2. Do returning visitors have a higher revenue than one-time visitors?






# Dataset

- **Online Shoppers Purchasing Intention Dataset** from UCI Machine Learning Repository
- Website traffic over **one-year period**
- 12,330 Sessions
- Target Variable: **'Revenue'**
- Features of interest:
  - **'PageValues'**
  - **'BounceRates'**
  - **'VisitorType'**





# Process

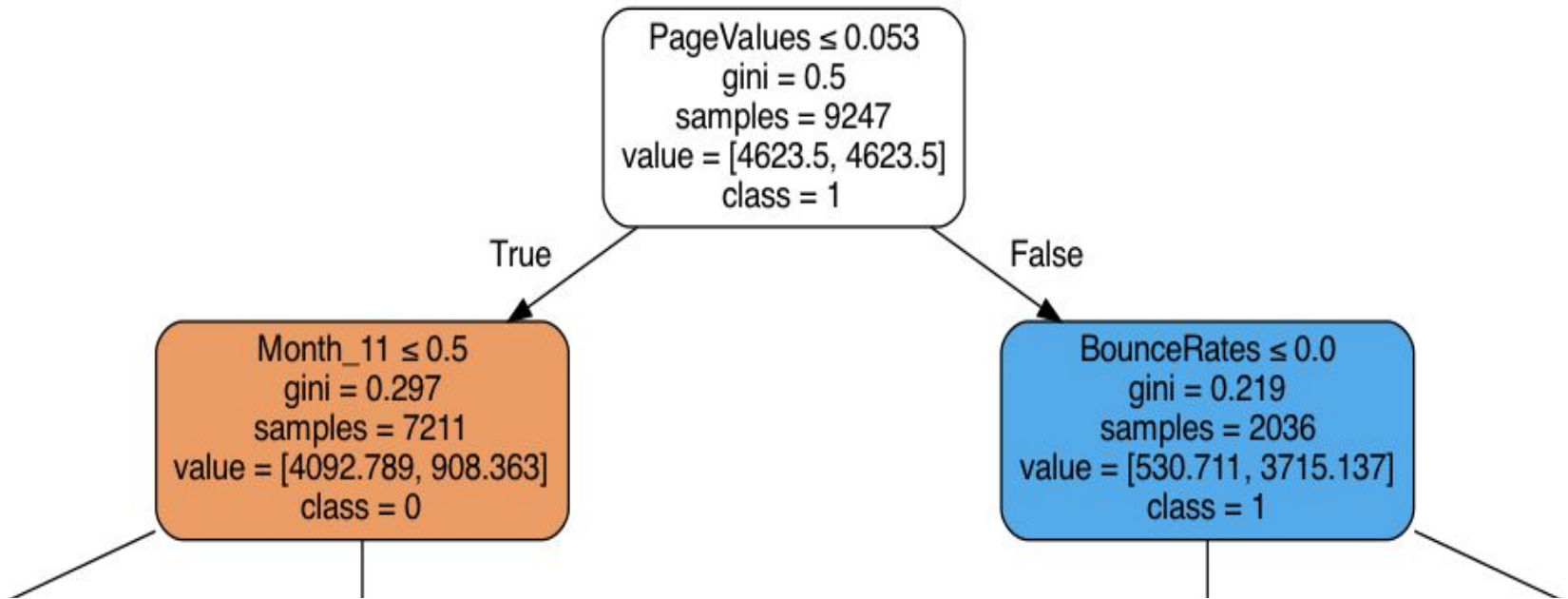
1. Gather data from UCI Repository
  2. Clean data
  3. Model Iterations
  4. Evaluate Each Model with Metrics
  5. Final Model Selection
  6. Analysis
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# Final Model Results

	train_f1	test_f1	train_recall	test_recall	test_auc
<b>Baseline Decision Tree</b>	1.000000	0.581633	1.000000	0.578093	0.750051
<b>max_depth=3</b>	0.657668	0.636859	0.619788	0.592292	0.770663
<b>SMOTE on max_depth=3</b>	0.635918	0.608029	0.488509	0.459073	0.704054
<b>Class Balanced on max_depth=3</b>	0.641290	0.661491	0.857244	0.864097	0.860813
<b>RFECV on max_depth=3</b>	0.813993	0.353840	0.896006	0.895107	0.919244

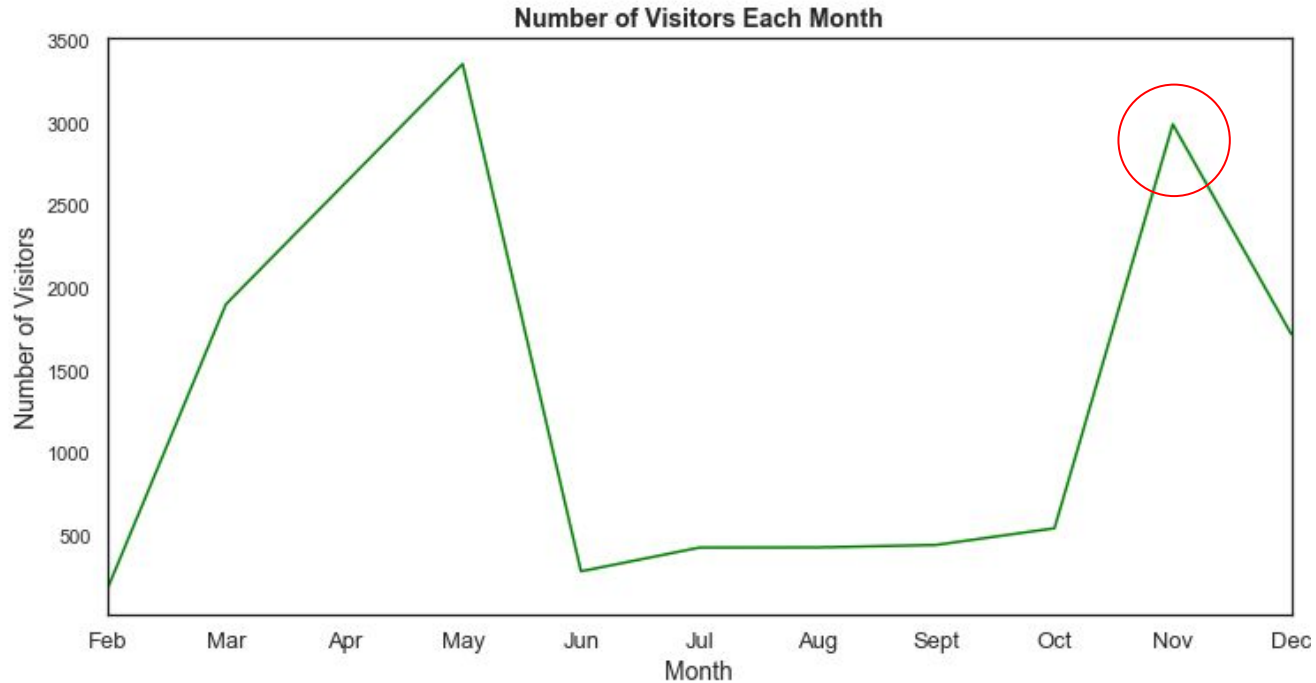
# Final Model Feature Importance





# Business Insights

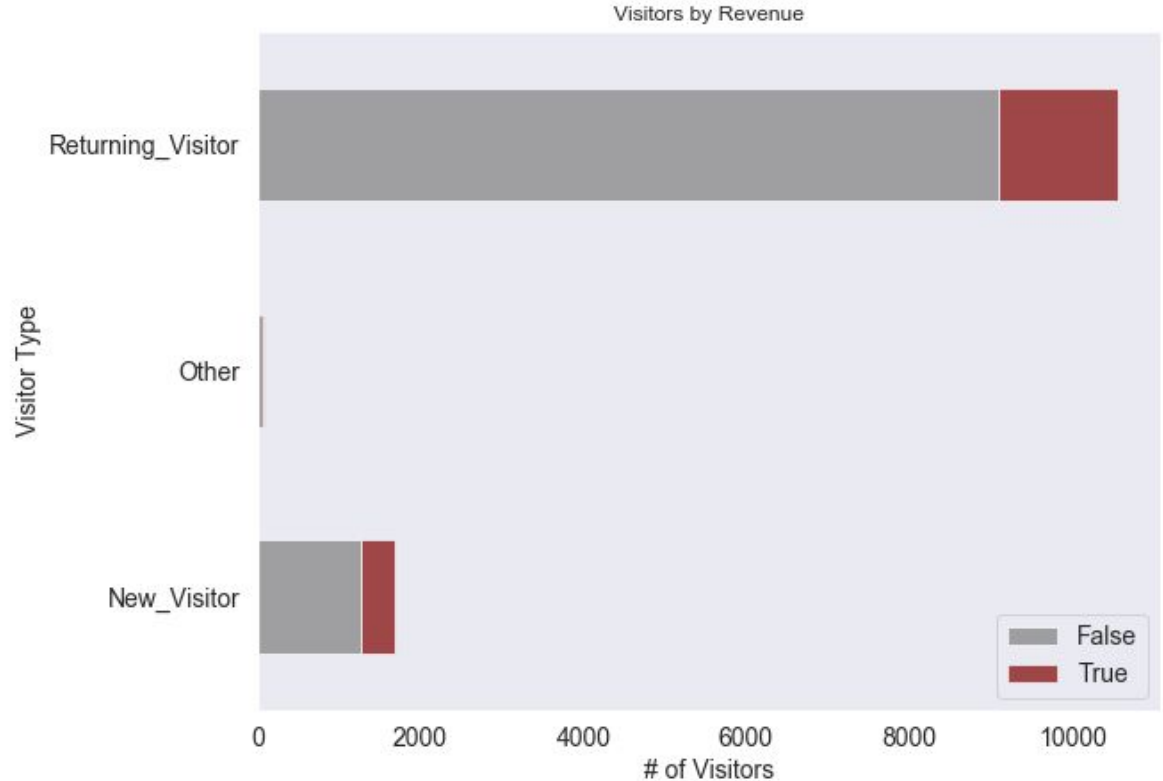
Question 1: How does the number of visitors differ each month?





# Business Insights

Question 2: Do returning visitors have a higher revenue than one-time visitors?





# Conclusion

**Business Question:** What are the areas of opportunity to increase conversion among people who visit the website?

- Majority of site viewers are returning visitors who are not purchasing
- Utilize personal viewer information to target advertising on those viewers
- Focus on peak months of May and November

Our classification model successfully increased the true positive rate, minimizing missed profits.



## Next Steps

- **Collect more data**, but include a legend for categorical variables to promote interpretability.
- **Webscrape** data from competing E-commerce stores to see how the model performs with that blind data.
- **A/B Testing** the web design of the prominence of Administrative and Informational page links to increase length of user session.