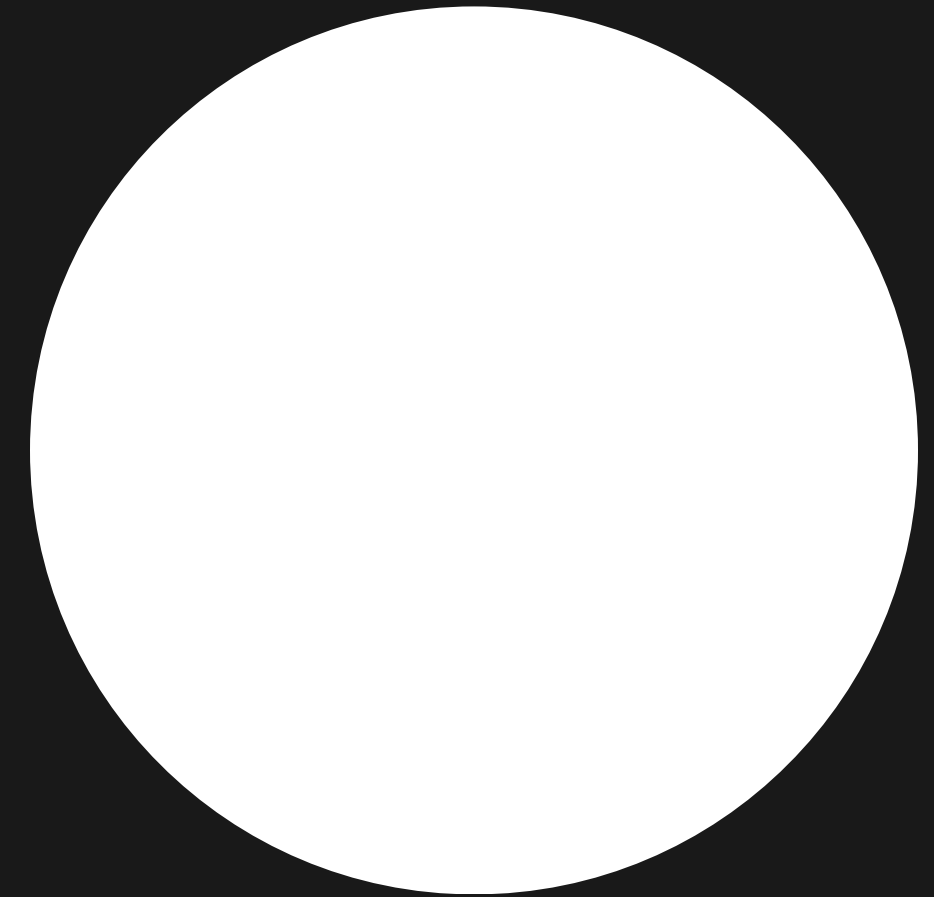


Predicting Term Deposit Subscription Using Classification Models

Subtitle: A Data-Driven Approach to Improving
Marketing Efficiency

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Date: 06-6-2025



Project Overview



- **OBJECTIVE:**

To help the bank identify clients who are likely to subscribe to a term deposit based on past campaign data.

- **APPROACH:**

We use machine learning classification models to predict responses, reduce marketing costs, and improve campaign efficiency.

Business Understanding



- **KEY QUESTIONS:**

- Who is likely to subscribe to a term deposit?
- When should the bank contact potential clients?
- How can we prioritize efforts to maximize conversions?

- **WHY IT MATTERS:**

Targeted outreach increases conversions and reduces unnecessary costs.

Data Understanding



- **Data Source:** Bank Marketing Campaign Dataset
- **Features:** Demographics, campaign details, call outcomes, duration, previous contacts, etc.
- **Target:** Subscription to term deposit (Yes/No)

Why Machine Learning?

- **REASONING:**
- Patterns are non-linear and involve multiple variables.
- Manual analysis would be inefficient and less accurate.
- **MACHINE LEARNING ENABLES:**
- Automation
- Probabilistic ranking
- Better prediction accuracy

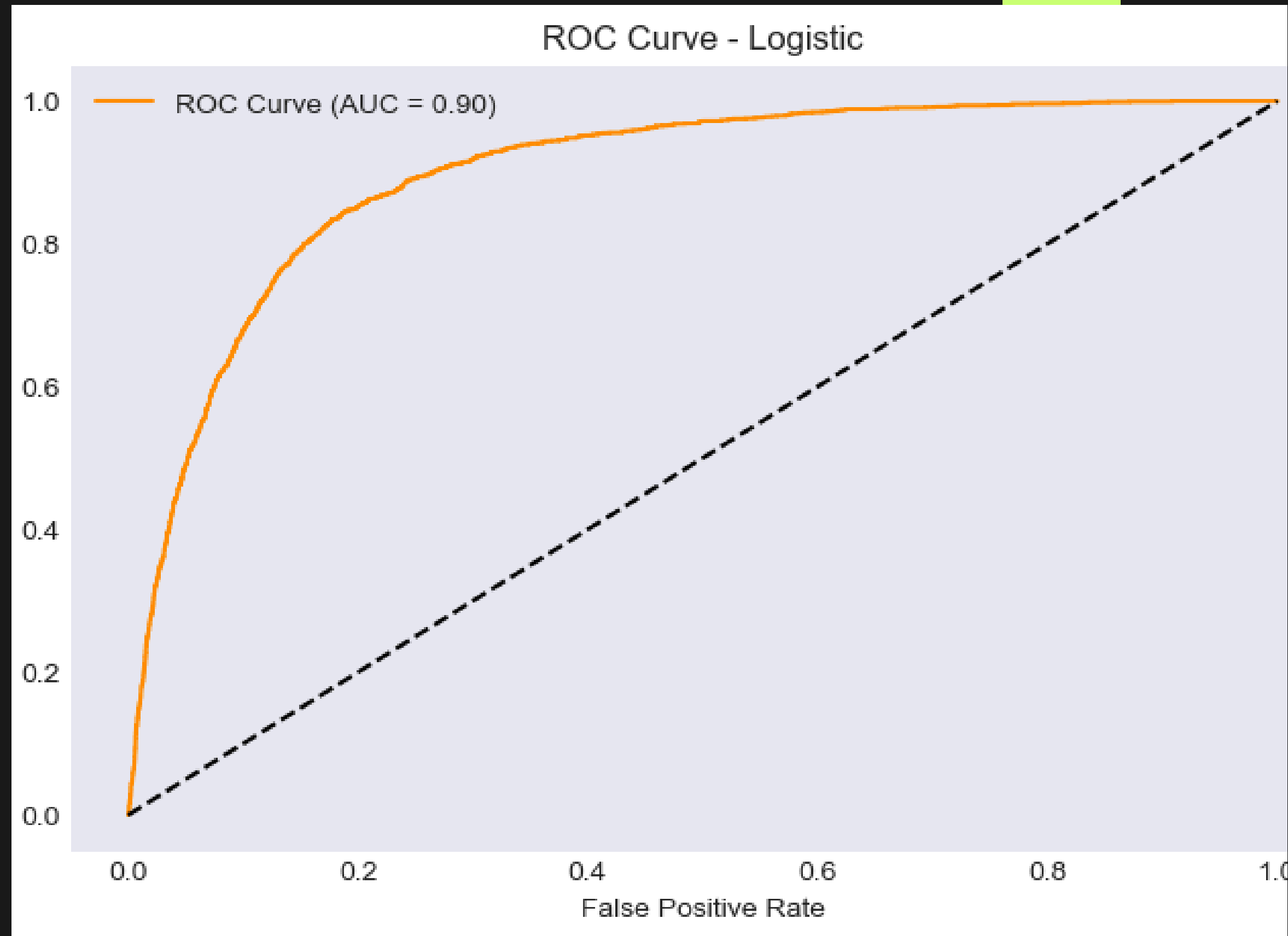
Modeling Approach

- **MODELS USED:**
- Logistic Regression (baseline, interpretable)
- Decision Tree (rules-based)
- **PROCESS:**
- Data preprocessing & feature encoding
- Train-test split
- Model training & evaluation



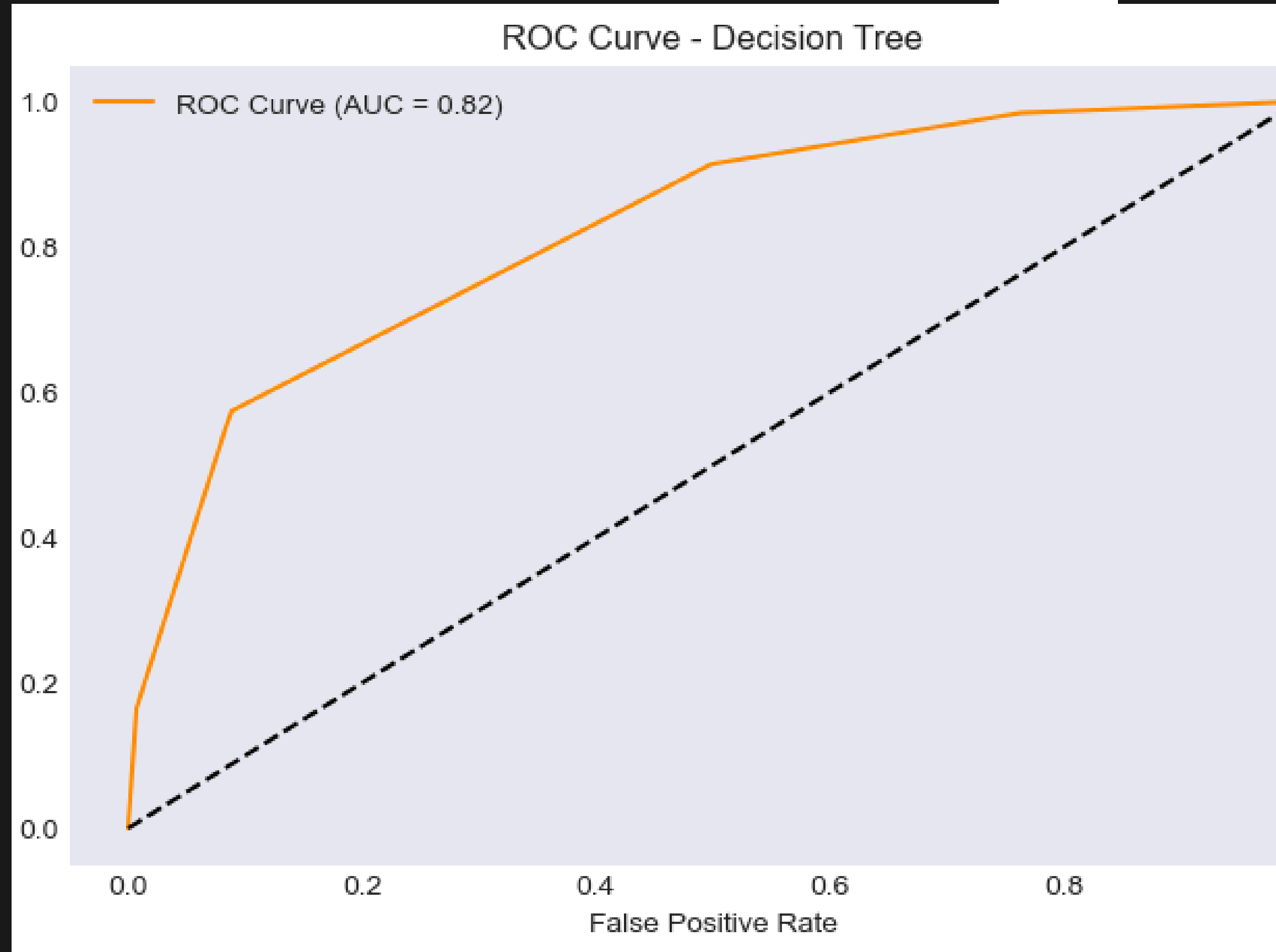
Model Evaluation (Logistic Regression)

- **METRICS:**
- Accuracy: 84.6%
- Precision: 41.8%
- Recall: 78.5%
- ROC AUC: 89.7%
- **INTERPRETATION:**
HIGH RECALL HELPS
MINIMIZE MISSED
OPPORTUNITIES
(FALSE NEGATIVES).

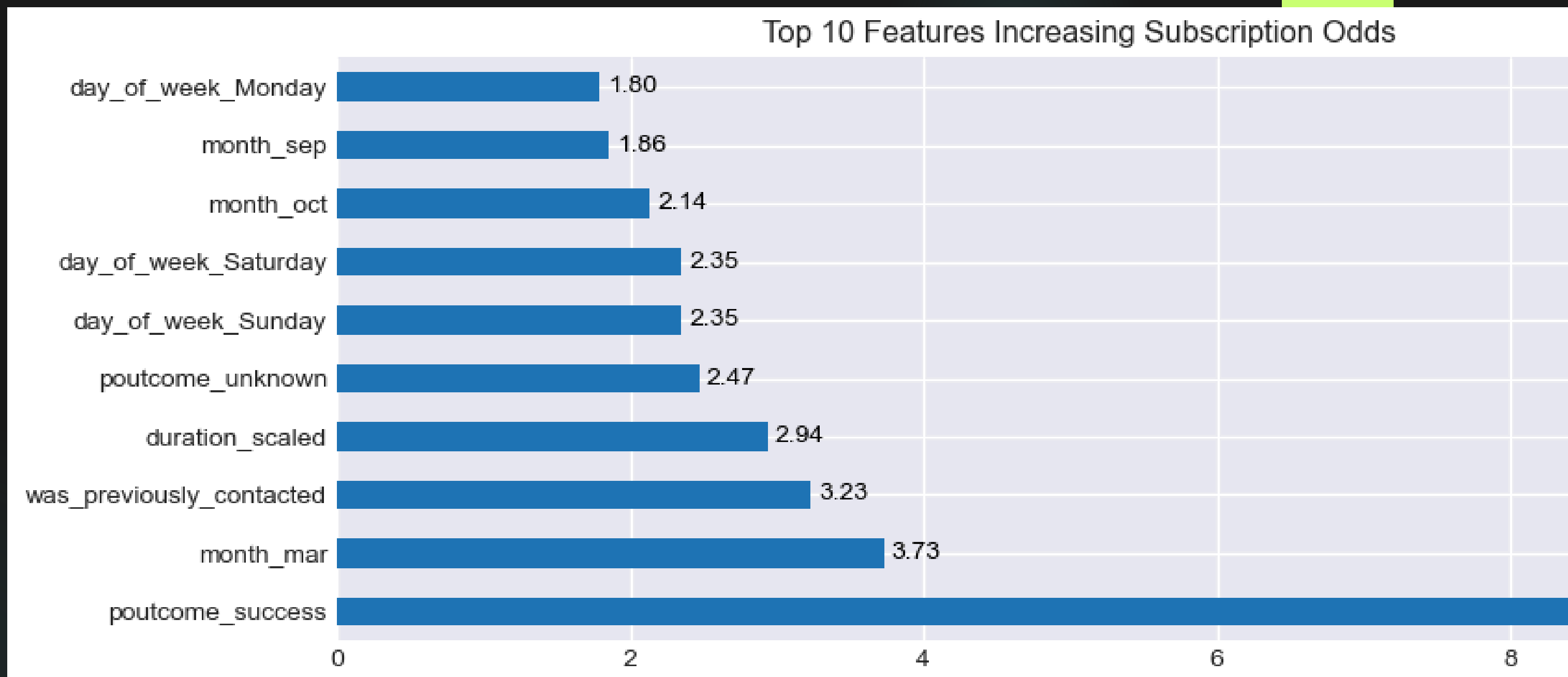


Model Evaluation (Decision Tree)

- **METRICS:**
- Accuracy: 87.1%
- Precision: 46.4%
- Recall: 57.4%
- ROC AUC: 82.2%
- **INTERPRETATION:**
EASIER TO EXPLAIN
WITH VISUAL DECISION
RULES.



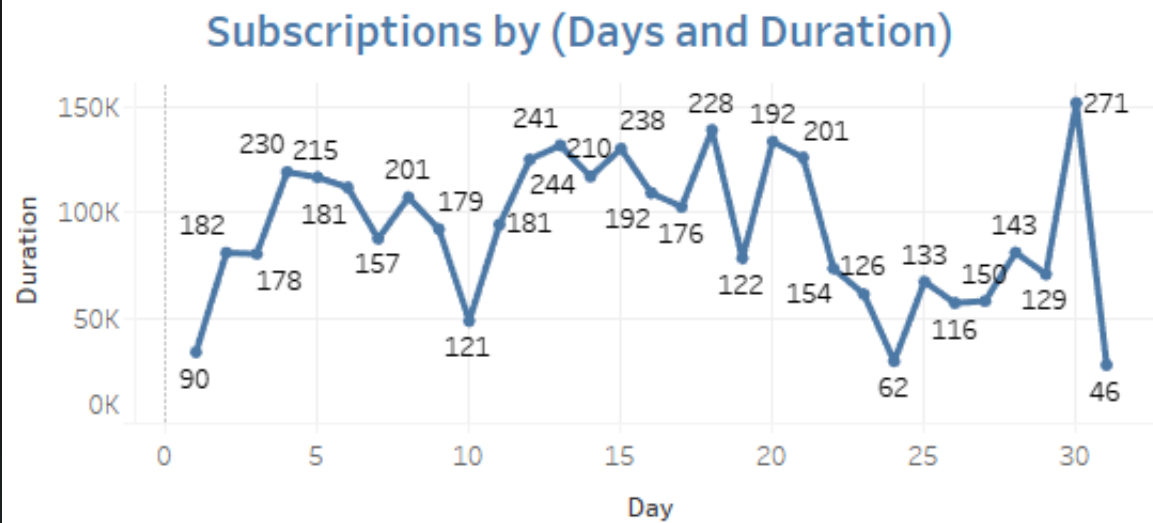
Key
Insights
From Odds
Ratios (Logistic
Model):
Successful
past outcomes
and contact
duration
significantly
boost likelihood
of subscription.



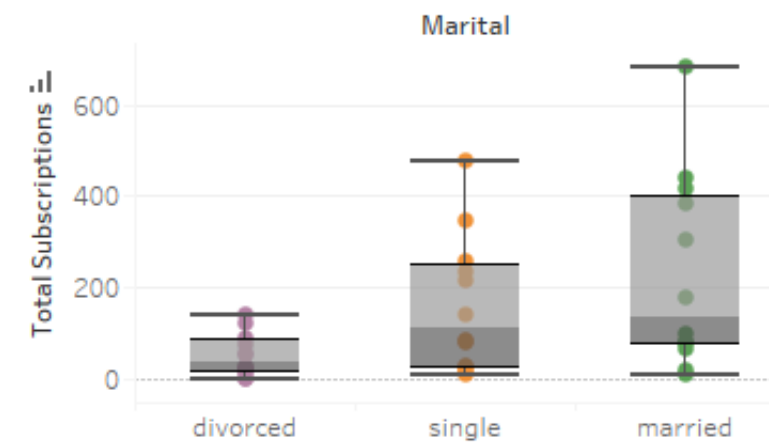
- March and October are high-conversion months.
- **FROM DECISION TREE:**
- Duration and contact success are key splits.

Recommendations

Subscribers per Different Features(Term Deposit)



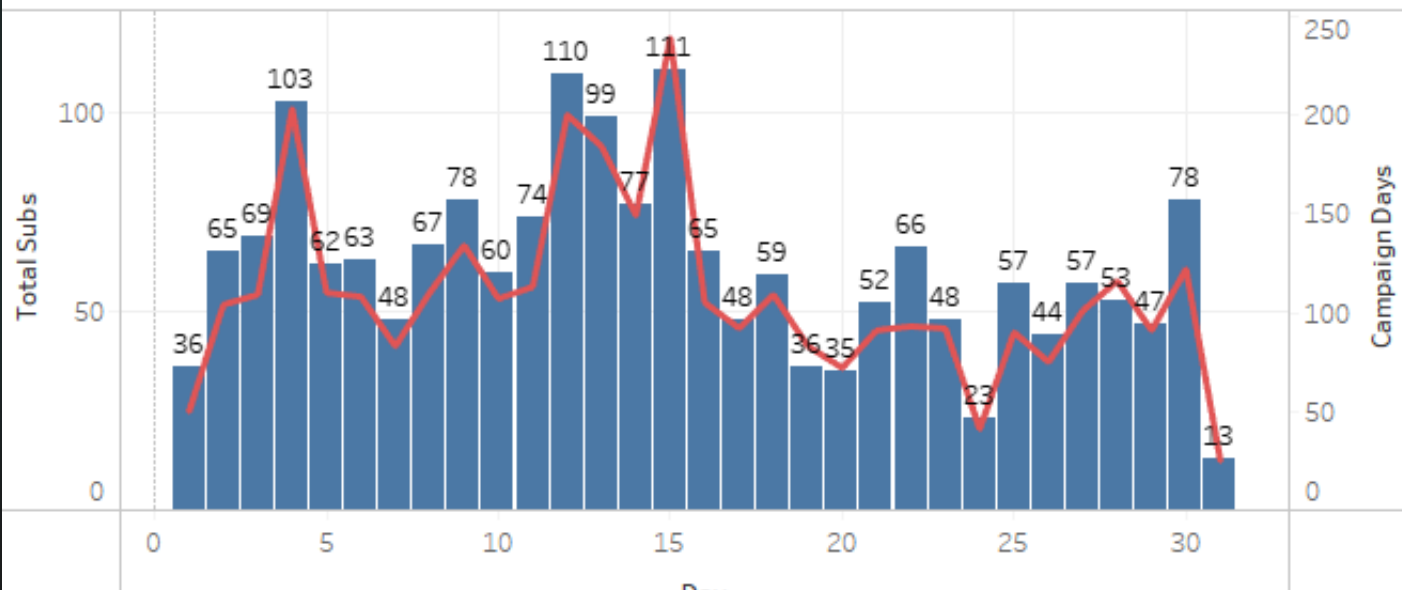
Subs per Marital Status



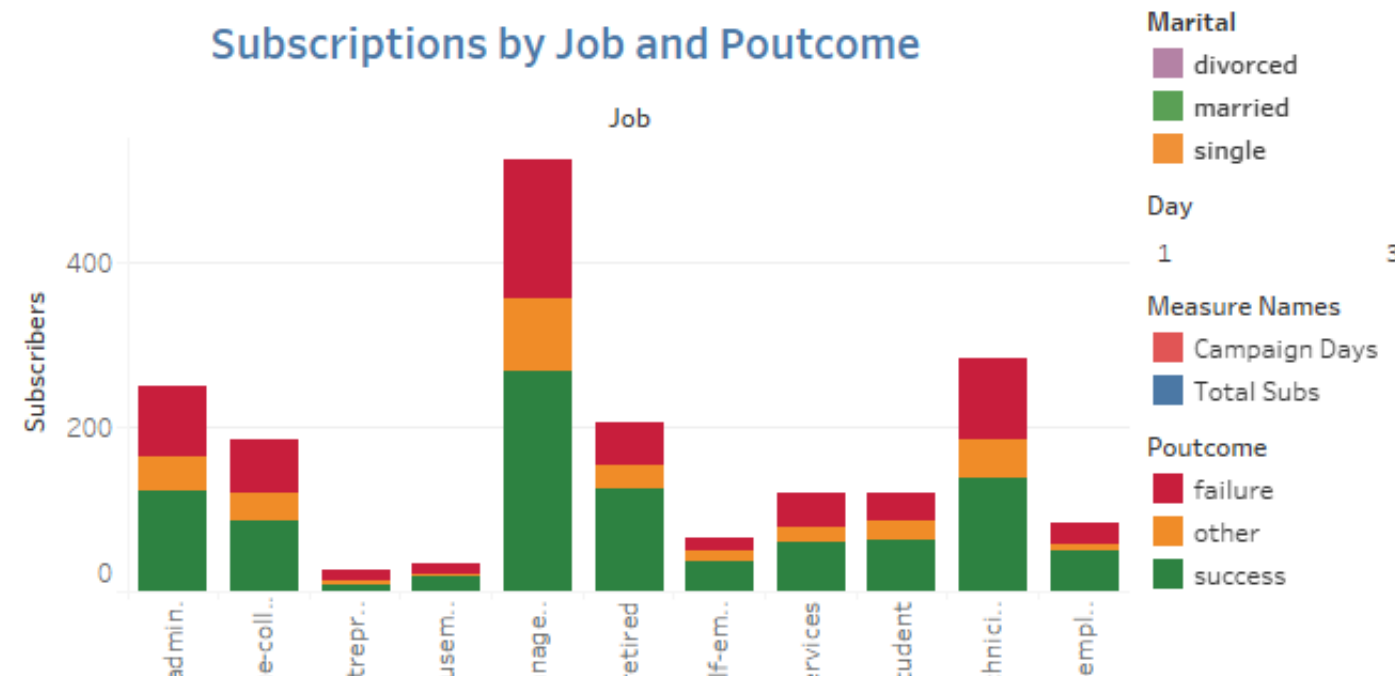
Subs per Poutcome



Subs per (Day/Campaign)



Subscriptions by Job and Poutcome



- Prioritize clients previously contacted successfully
- Time outreach to high-conversion months (e.g., March, October)
- Target clients with longer call engagement (duration > 300s)

Next Steps

- Integrate model into CRM for campaign prioritization.
- Monitor performance and retrain quarterly.
- Expand analysis with additional client behavior data.



Thank You

- **QUESTIONS?**

I welcome your feedback and suggestions.

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