**Summary and Evaluation of Campaign Performance**

**Overview**

The campaign targets customers predicted to respond positively to a marketing effort based on data from a previous campaign. The model uses customer and campaign data, including features such as balance, loan status, housing status, and campaign interaction history, to predict likelihood of conversion. The evaluation of the campaign's performance involves both predictive accuracy and potential financial outcomes.

**Objectives**

1. To identify key customer segments likely to respond positively to a marketing campaign.
2. To calculate and compare expected and actual returns based on campaign performance.
3. To recommend customers for a second phase of the campaign based on predictive analysis.

**Data Overview**

The dataset comprises information from multiple tables (Clients, Accounts, Campaigns, and Outcomes), which were joined to create a unified view. Key features include demographic data, account balance, past campaign engagement, and campaign outcomes (yes, no, unknown).

**Dataset Statistics**:

* Total customers: **45,211**
* Positive balance customers: **37,931**
* Non-defaulting "good" customers: **37,672**

**Model Performance**

**Used alpha parameter to calculate expected revenue:**

**Expected\_revenue = cost +( alpha \* balance)**

**Where,**

**cost = -2 (cost of calling each customer) \* no. of people who are predicted to subscribe,**

**alpha = percent cut the bank gets from the balance when someone subscribes for term deposit**

* **Validation Accuracy of XG Boost model**: 88.74%
* **Validation ROC-AUC Score**: 85.02%
* **Evaluation Metrics**:
  + **Number of reached customers (predicted positives)**: 42
  + **Number of converted customers (actual positives within predictions)**: 24
  + **Conversion Ratio**: 57.14%
  + **Expected Average Return per Contacted Customer**: 179.66 euros
  + **Actual Average Return per Converted Customer**: 69.63 euros
  + **Return Ratio (Actual vs. Expected)**: 38.76%

A screen shot of a computer

Description automatically generated

**Model predictions for future customers:**

* **Future Campaign Insights**:
  + **Expected Average Return per Future Contacted Customer (with alpha = 5%):** 40.06 euros
  + **Totally the model predicted, 2280 customers to subscribe to the term deposit scheme, therefore expected revenue =** 2280 \* 40**.**06 = **91336 euros**