EVALUATION OF A MARKETING CAMPAIGN

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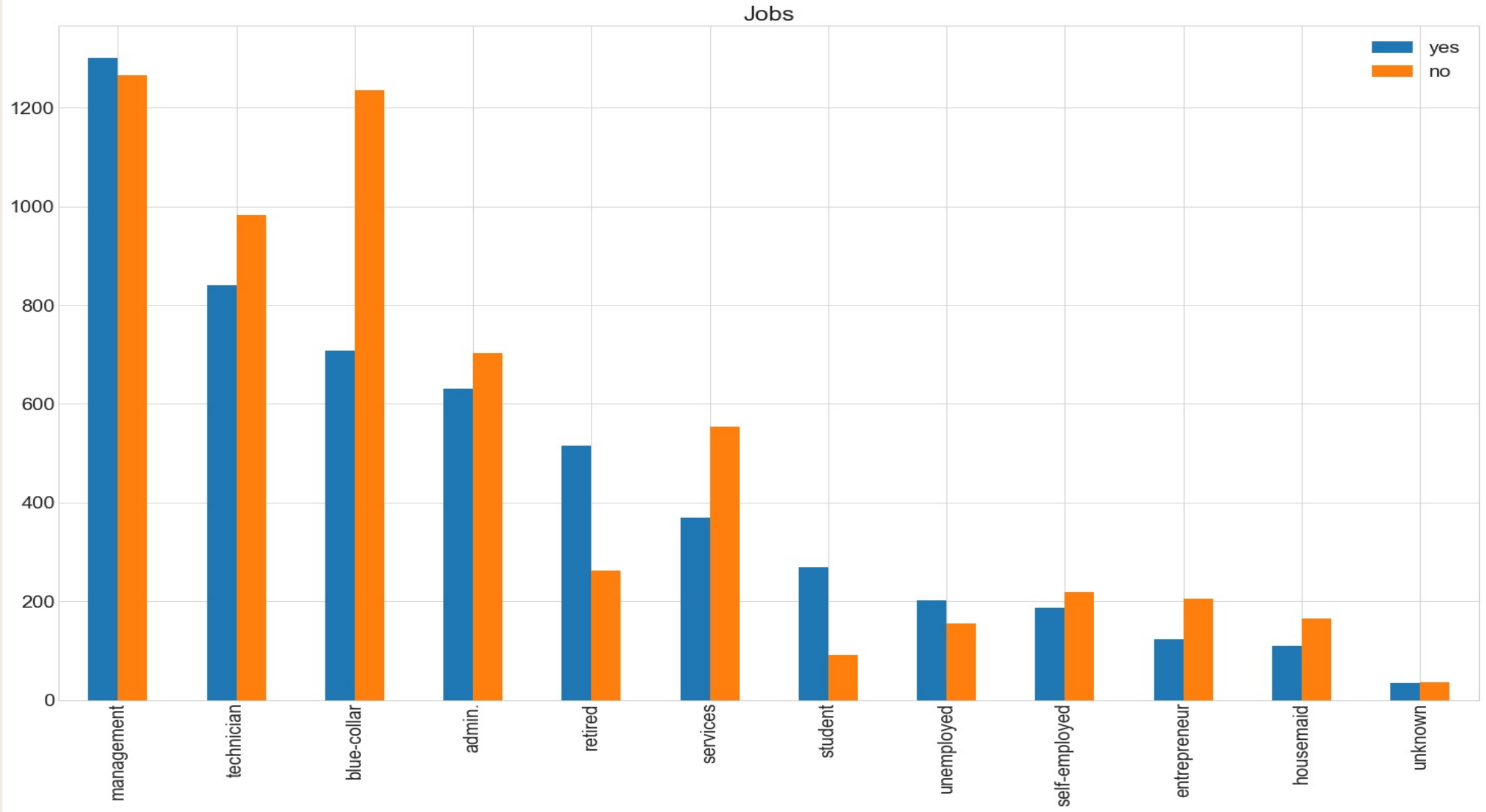
BANK MARKETING DATASET

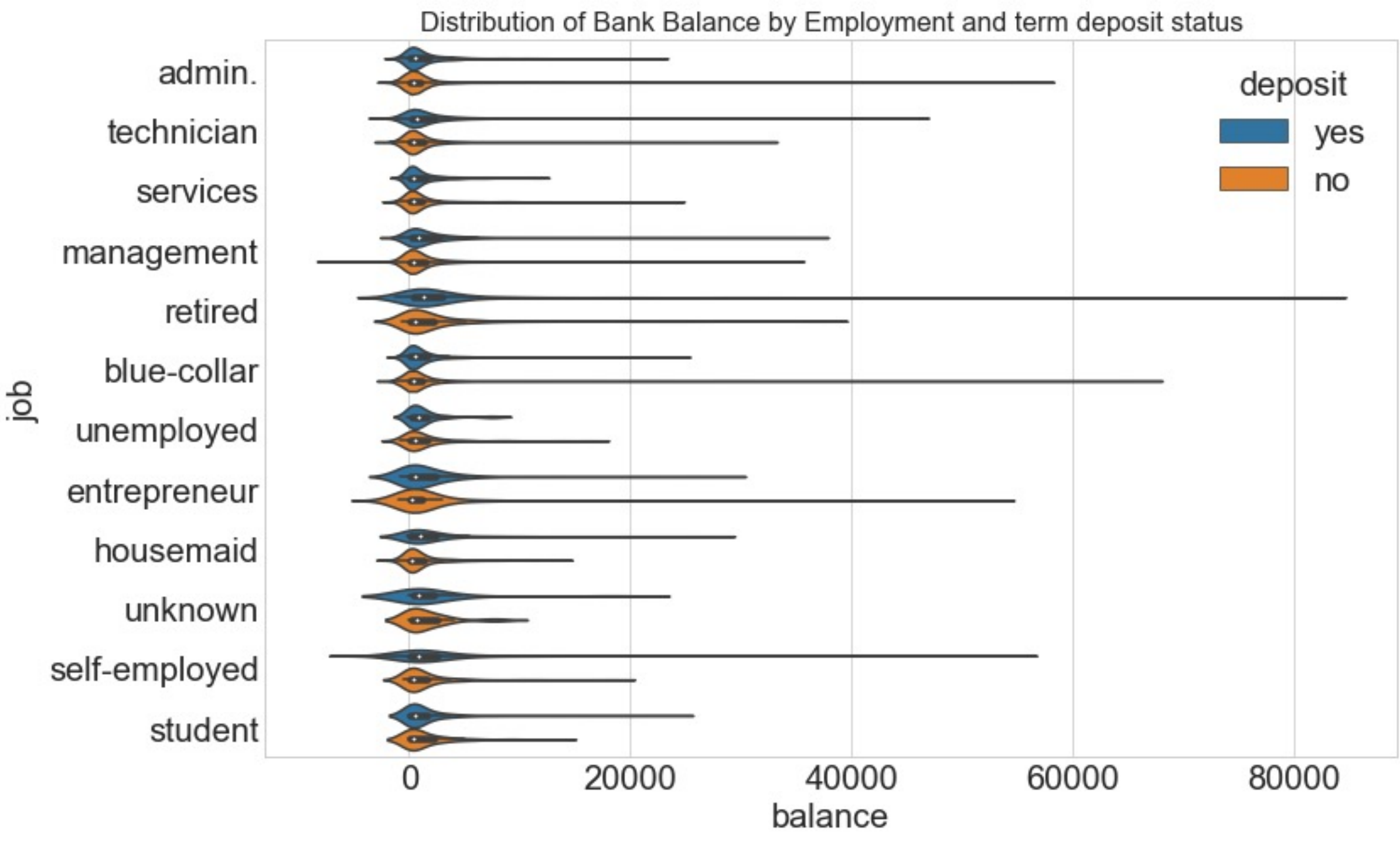
- Published by OpenML, retrieved from Kaggle. Data from a Portuguese Banking Institution.
- Marketing focused on term deposit subscriptions.
- Attributes are information related to the clients of the Bank from the current Marketing campaign and the previous one.

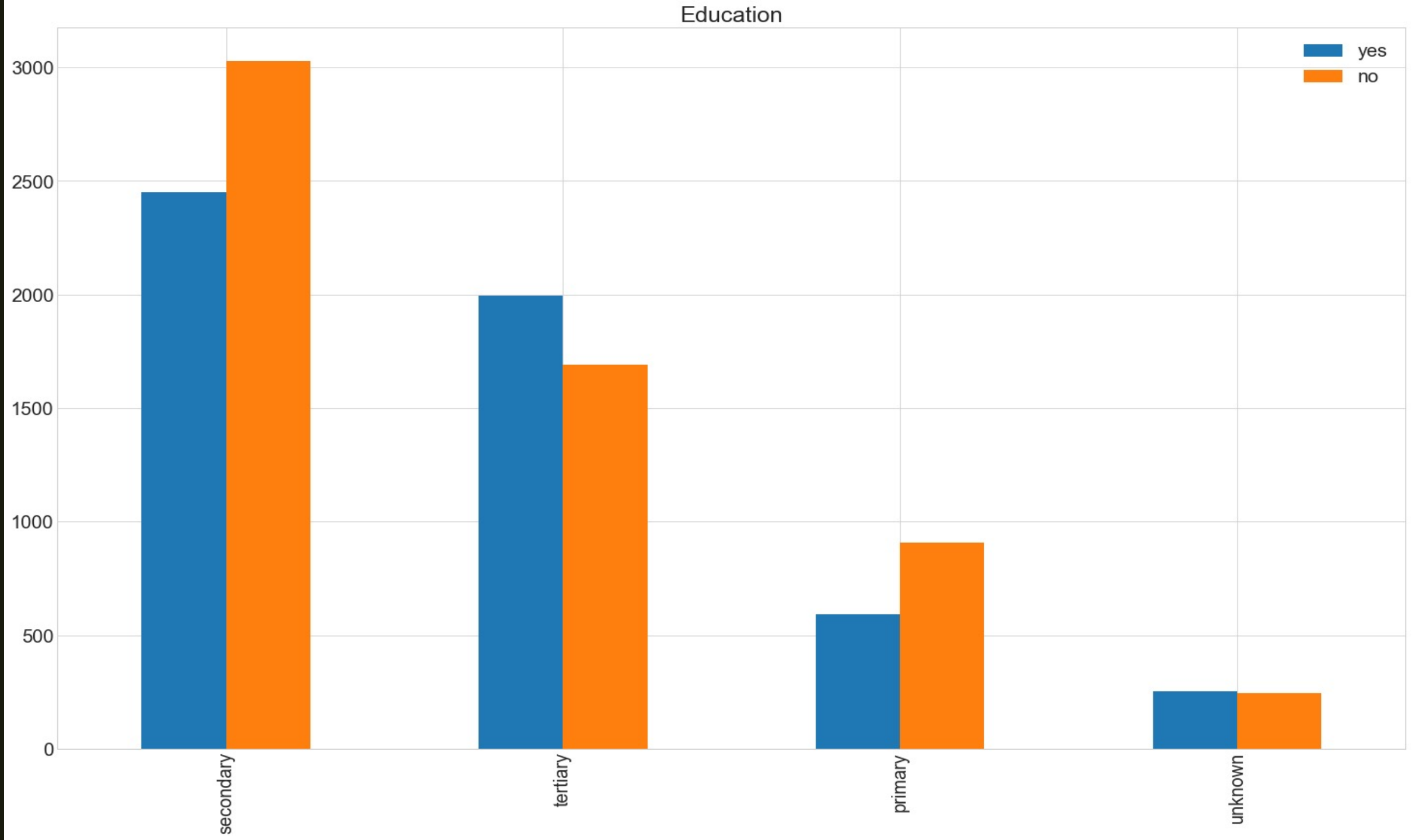
RESEARCH SCENARIO

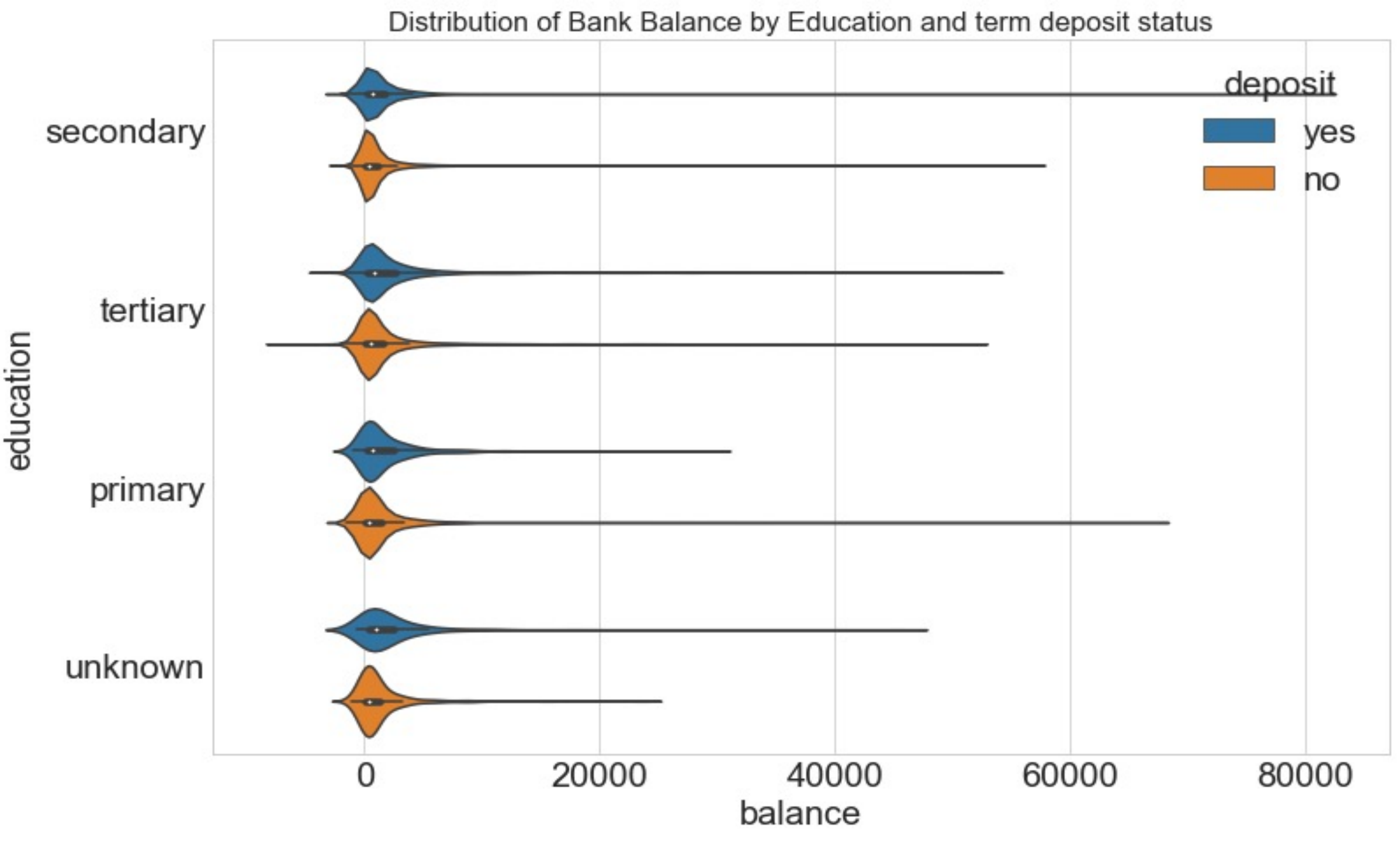
- Classify and predict the outcome of the current campaign.
- Find characteristics to keep in mind for the next marketing campaign.

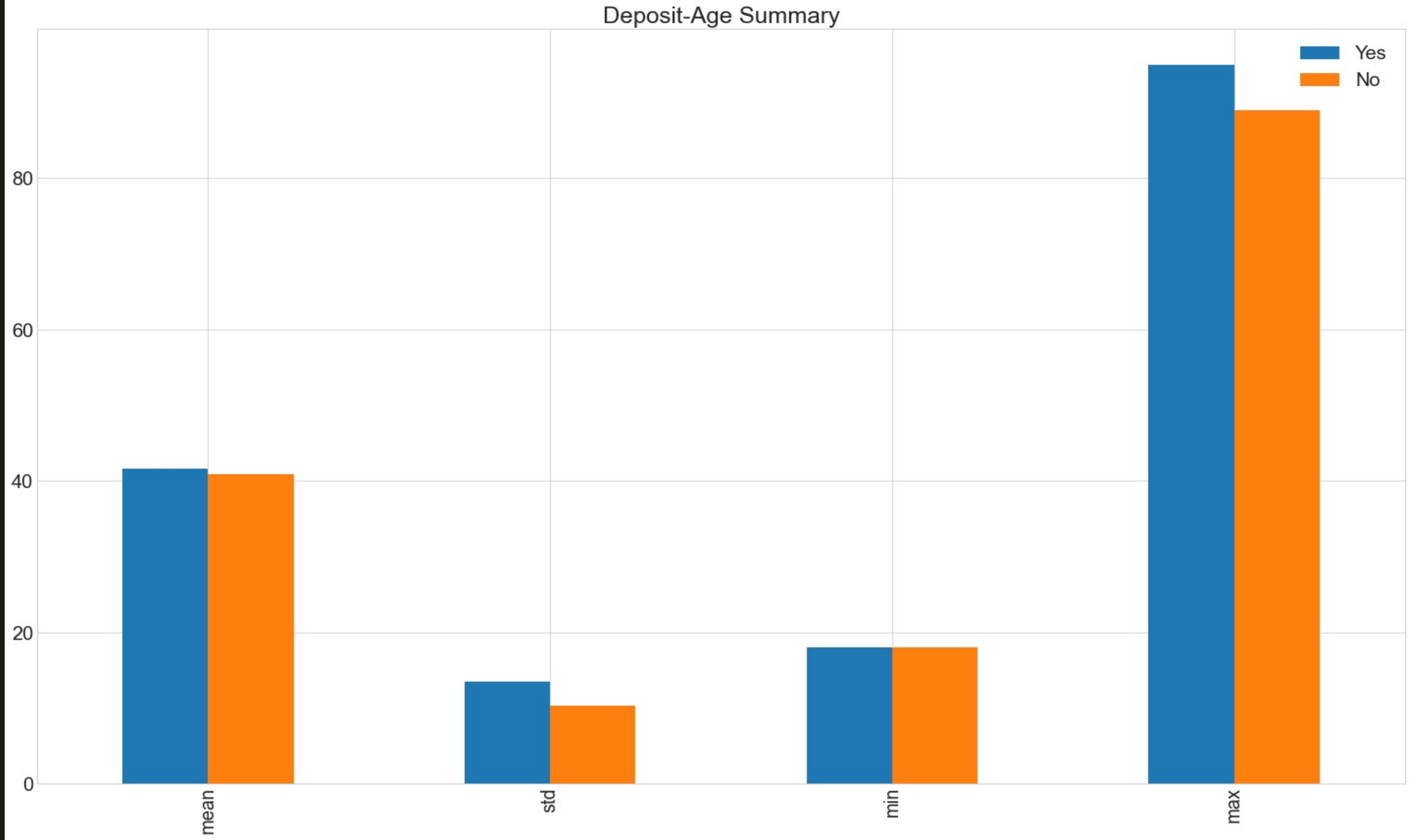
TERM DEPOSIT DEMOGRAPHICS




Distribution of Bank Balance by Employment and term deposit status
admin.
technician
services
management
retired
blue-collar
unemployed
entrepreneur
housemaid
unknown
self-employed
student
job
deposit
yes
no
0
20000
40000
60000
80000
balance


Education
yes
no
3000
2500
2000
1500
1000
500
0
secondary
tertiary
primary
unknown


Distribution of Bank Balance by Education and term deposit status
deposit
yes
no
secondary
tertiary
primary
unknown
education
0
20000
40000
60000
80000
balance

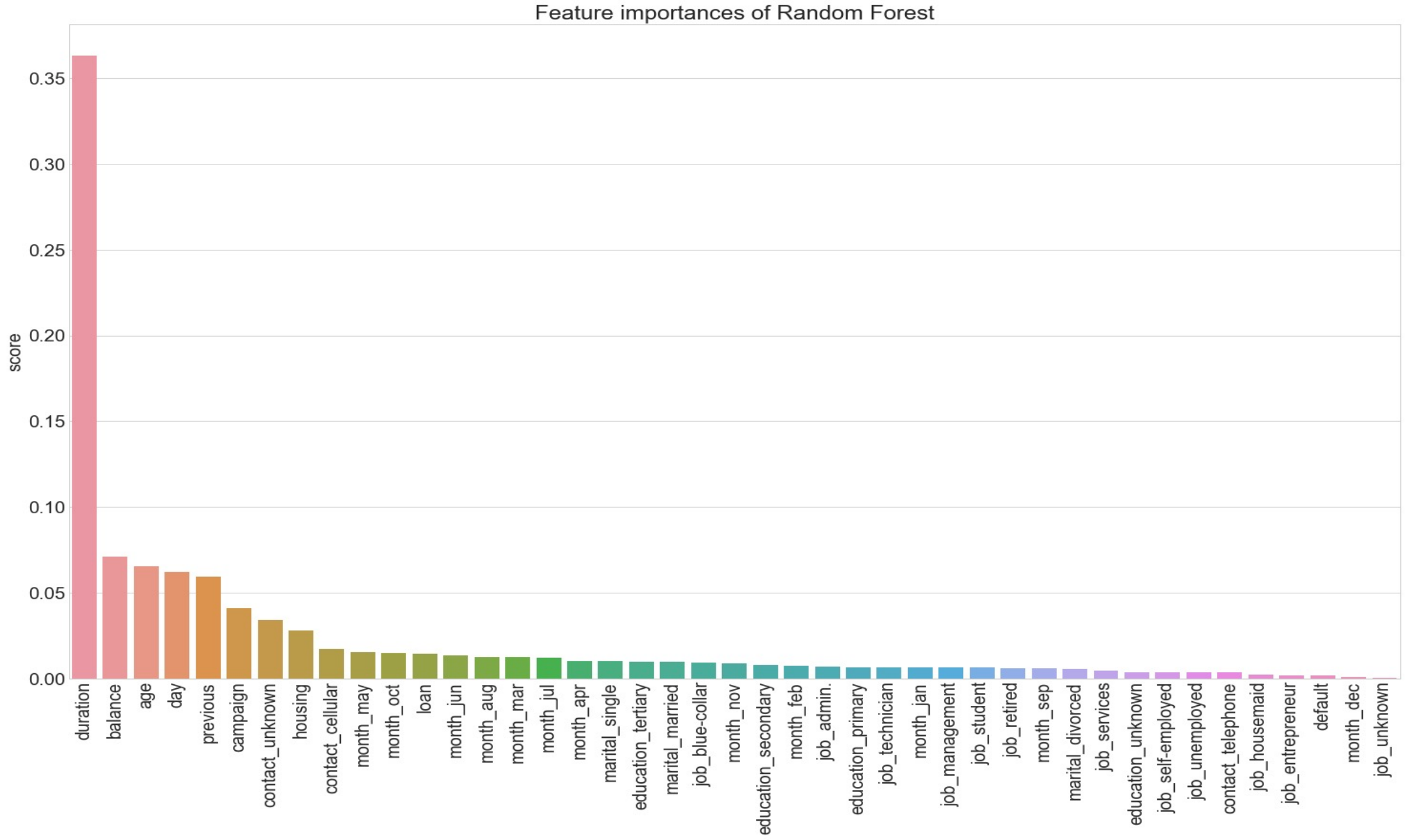

Deposit-Age Summary
Yes
No
80
60
40
20
0
mean
std
min
max

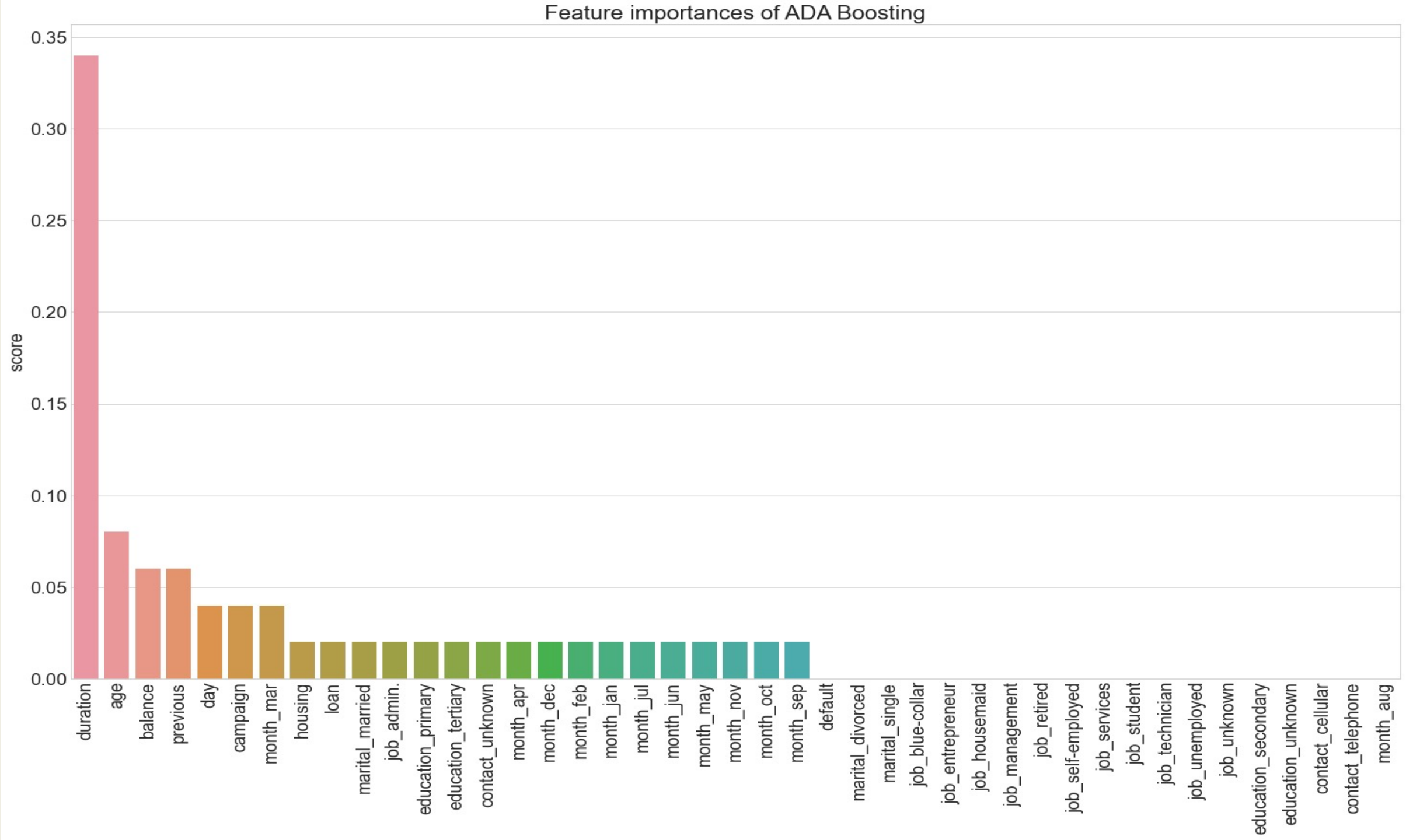
PREPARING THE DATA

- Check for null and duplicate values and drop Irrelevant columns
- Turned Categorical Variables into Dummy Variables and Numerical Binary Variables
- 50:50 split of dataset into training and test set

ALGORITHM ANALYSIS: ACCURACY

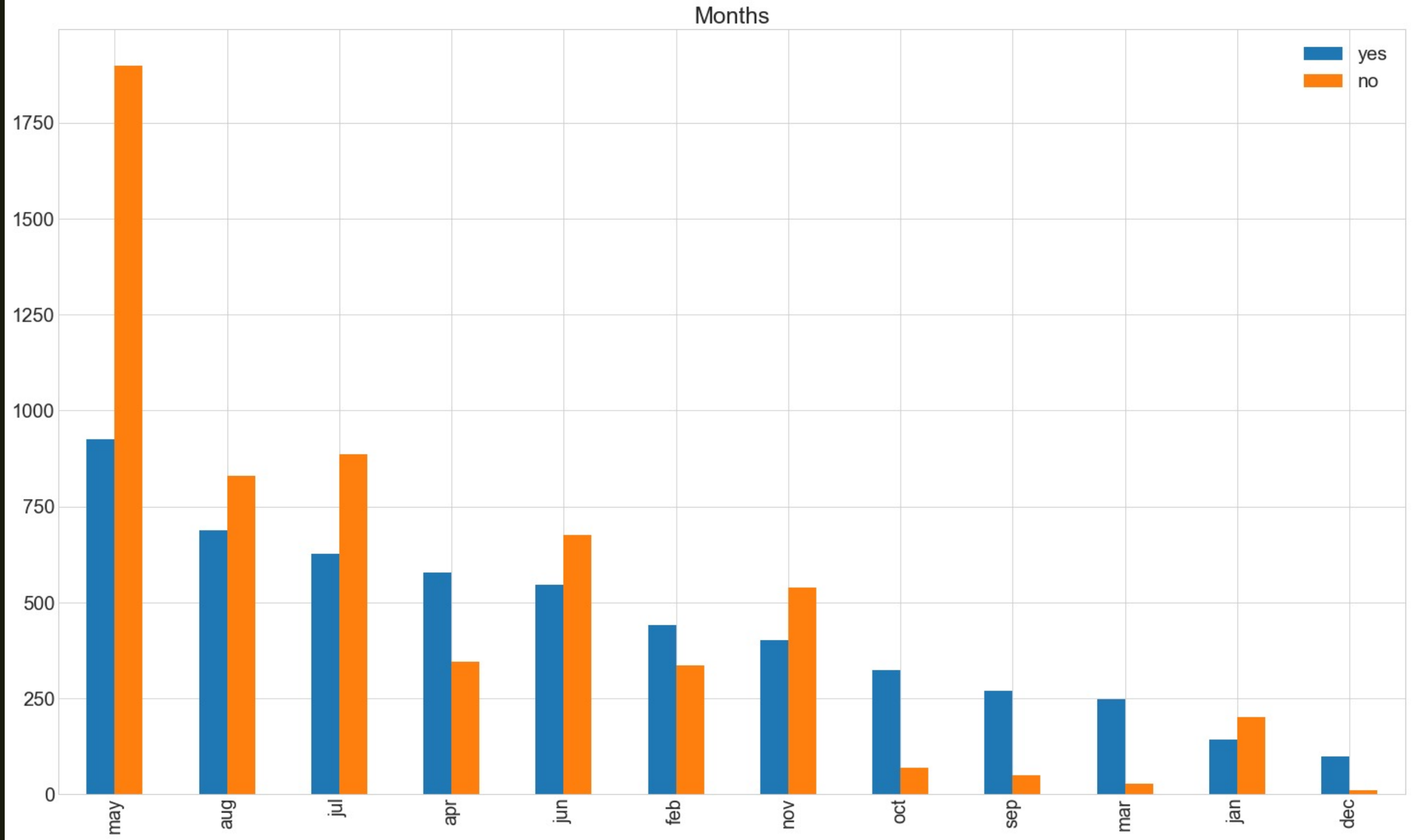
- Logistic Regression : 0.7968, True Positive Rate: 79.74, True Negative Ratio: 79.62
- Random Forest : 0.8420, True Positive Rate: 87.39, True Negative Ratio: 81.19.
- Ada Boosting : 0.8104, True Positive Rate: 78.93, True Negative Ratio: 83.03.


Feature importances of Random Forest
score
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
duration
balance
age
day
previous
campaign
contact_unknown
housing
contact_cellular
month_may
month_oct
loan
month_jun
month_aug
month_mar
month_jul
month_apr
marital_single
education_tertiary
marital_married
job_blue-collar
month_nov
education_secondary
month_feb
job_admin.
education_primary
job_technician
month_jan
job_management
job_student
job_retired
month_sep
marital_divorced
job_services
education_unknown
job_self-employed
job_unemployed
contact_telephone
job_housemaid
job_entrepreneur
default
month_dec
job_unknown


Feature importances of ADA Boosting
score
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
duration
age
balance
previous
day
campaign
month_mar
housing
loan
marital_married
job_admin.
education_primary
education_tertiary
contact_unknown
month_apr
month_dec
month_feb
month_jan
month_jul
month_jun
month_may
month_nov
month_oct
month_sep
default
marital_divorced
marital_single
job_blue-collar
job_entrepreneur
job_housemaid
job_management
job_retired
job_self-employed
job_services
job_student
job_technician
job_unemployed
job_unknown
education_secondary
education_unknown
contact_cellular
contact_telephone
month_aug

CONCLUSION

- Focus on Ages < 30 and Ages > 50.
- Put emphasis on segments of clients who do not have regular employment and higher secondary level of education.
- Target group with duration of contact around the average line.


Months
yes
no
1750
1500
1250
1000
750
500
250
0
may
aug
jul
apr
jun
feb
nov
oct
sep
mar
jan
dec

CONCLUSION

- Focus on Ages < 30 and Ages > 50.
- Focus Marketing on months of February, March, September and October.
- Put emphasis on segments of clients who do not have regular employment and higher secondary level of education.
- Target group with duration of contact around the average line.

DATASET

- https://www.kaggle.com/janiobachmann/bank-marketing-dataset
- https://github.com/datasets/openml-datasets/tree/master/data/bank-marketing