Kin
ANALYTICS

Hackaton Results

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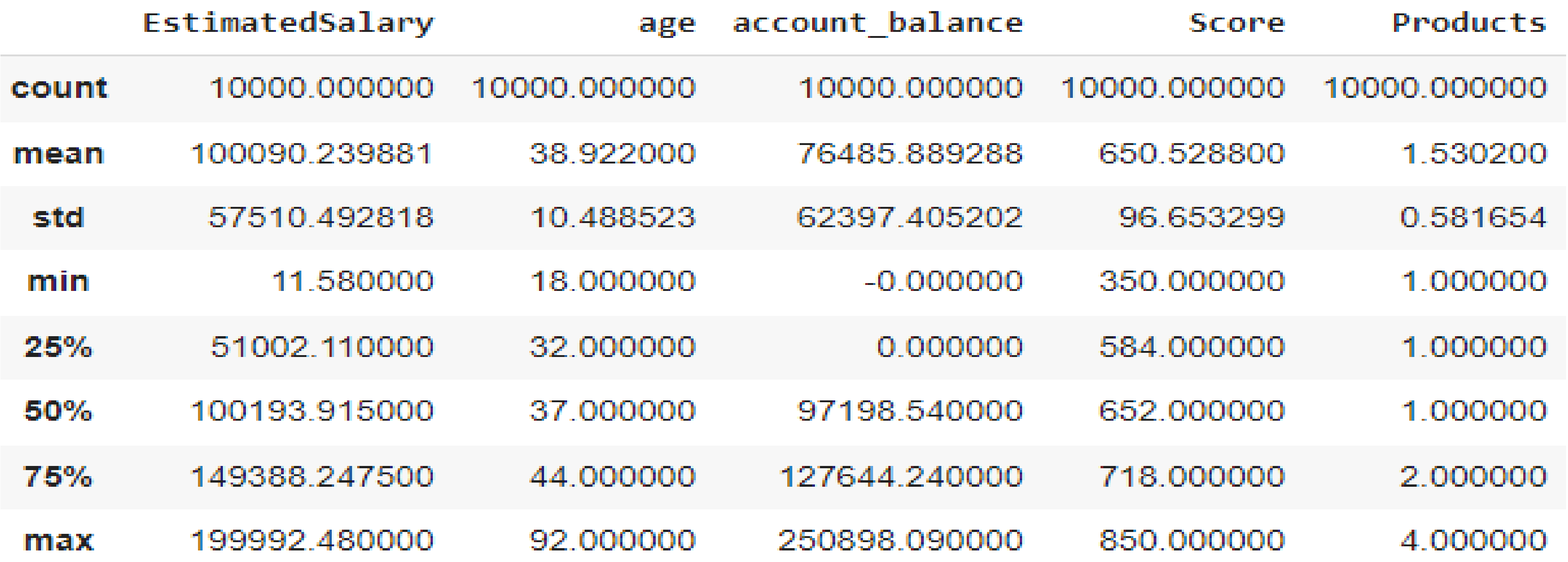
For the Finance and Risk Analyst position

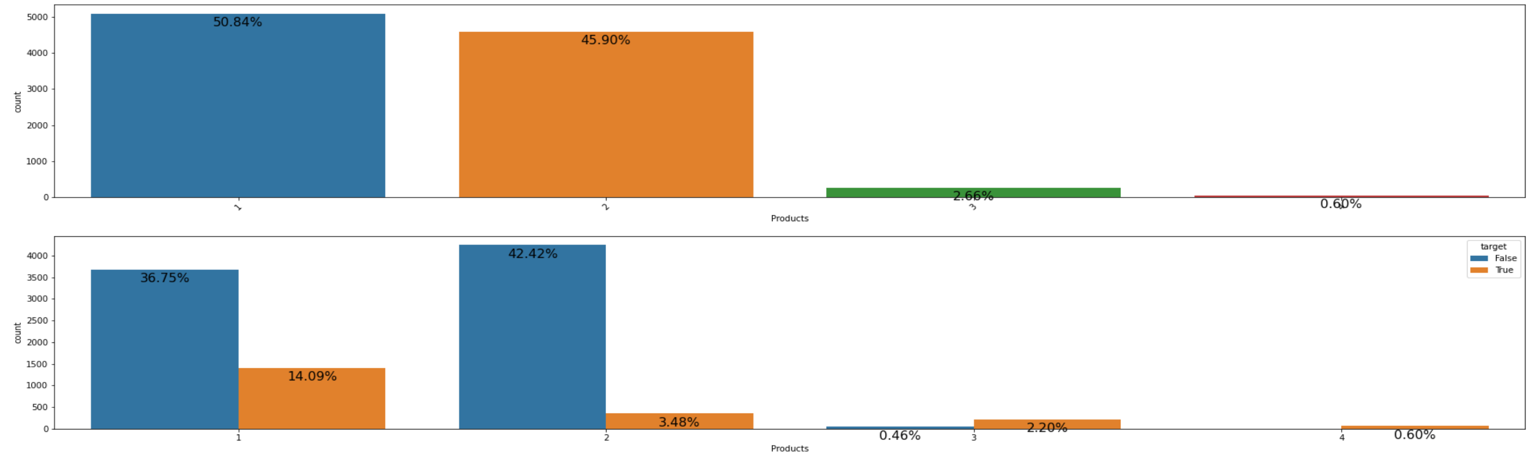
Desired Population

Filter Name	Action	Number of rows
Initial number of records	Check number of records	1545000
1st filter	Erase clients with contracts before 2015	623242
2nd filter	Erase Italian clients as they are not part of the company anymore	487424
3rd filter	Erase clients with more than 75% nulls (count number of variables with nulls)	450562
4th filter	Drop duplicated rows	464075
5th filter	Erase clients with less than 2 years of information (those who entered until November 2017)	10000

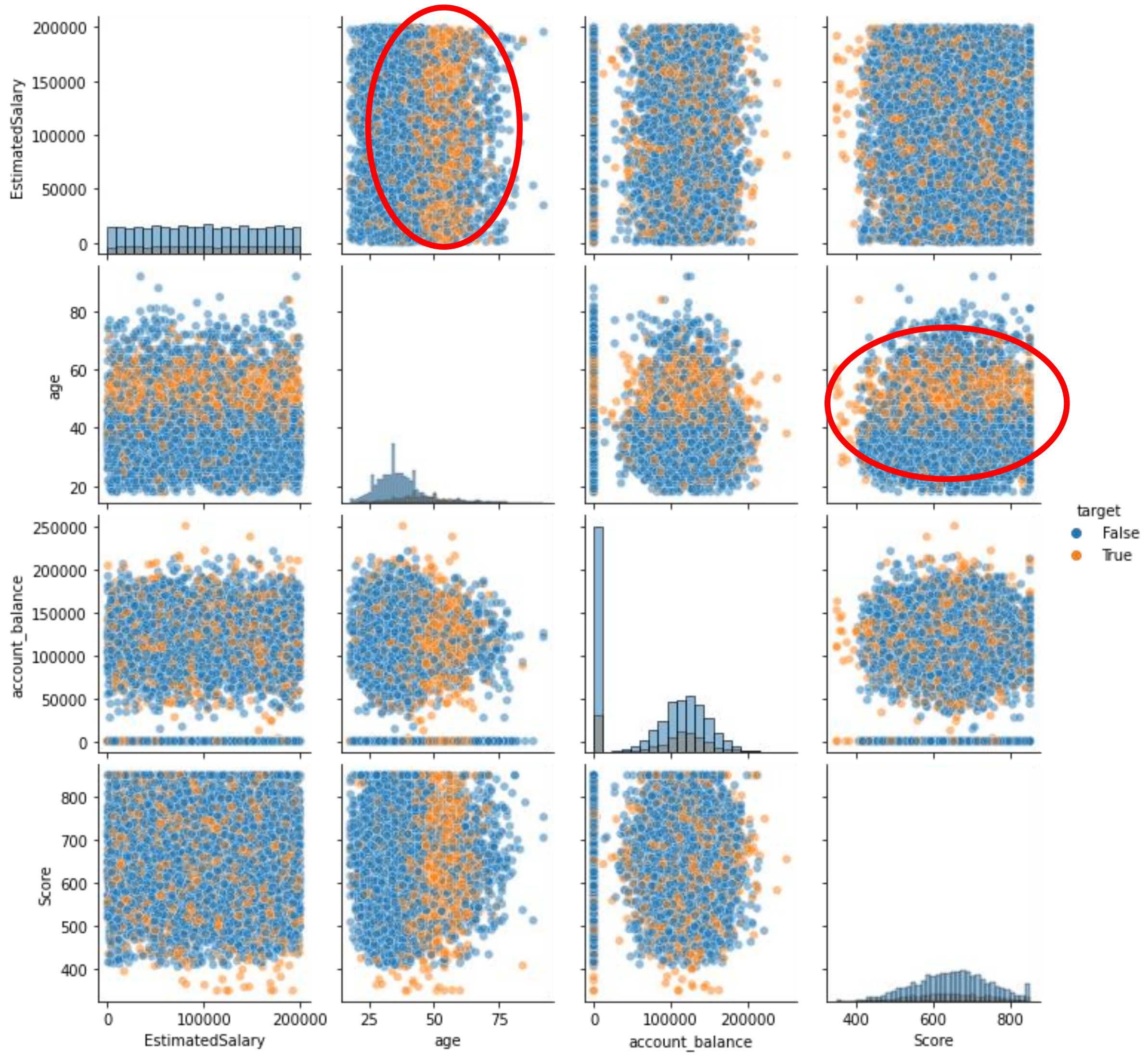
New Variables Created

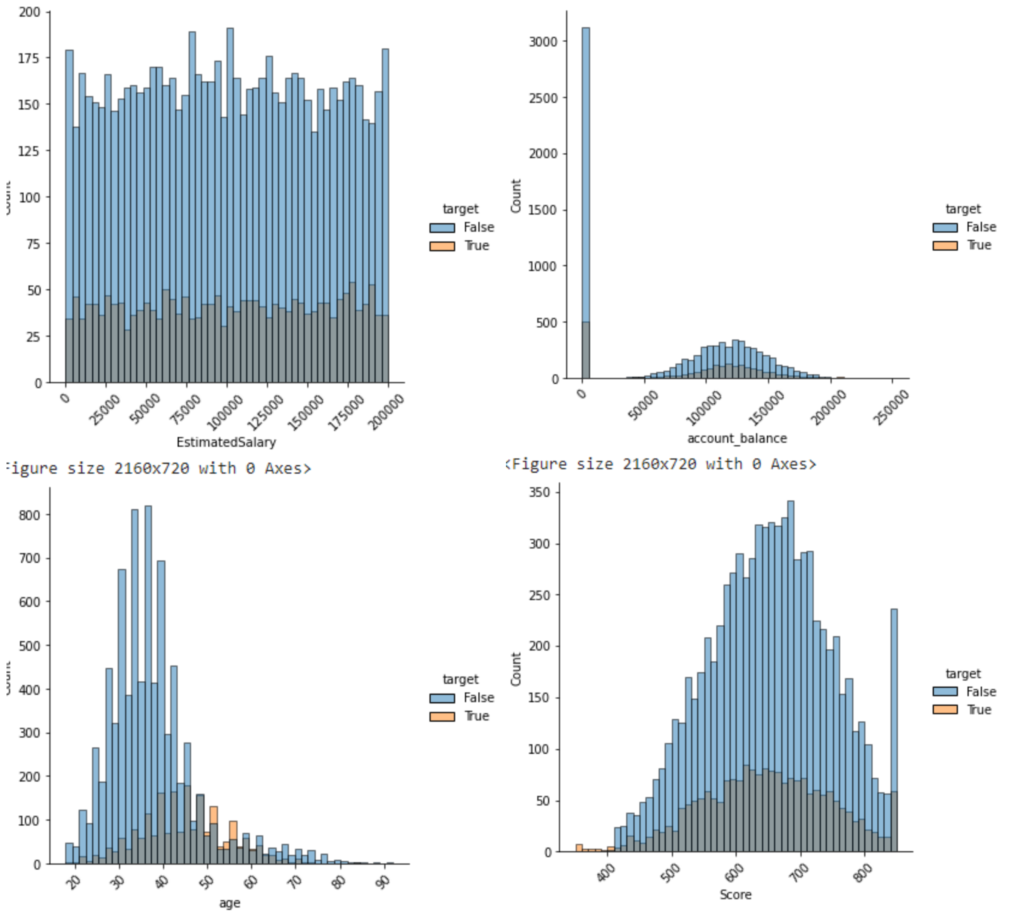


	EstimatedSalary	age	account_balance	Score	Products
count	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000
mean	100090.239881	38.922000	76485.889288	650.528800	1.530200
std	57510.492818	10.488523	62397.405202	96.653299	0.581654
min	11.580000	18.000000	-0.000000	350.000000	1.000000
25%	51002.110000	32.000000	0.000000	584.000000	1.000000
50%	100193.915000	37.000000	97198.540000	652.000000	1.000000
75%	149388.247500	44.000000	127644.240000	718.000000	2.000000
max	199992.480000	92.000000	250898.090000	850.000000	4.000000



Distributions and data separability





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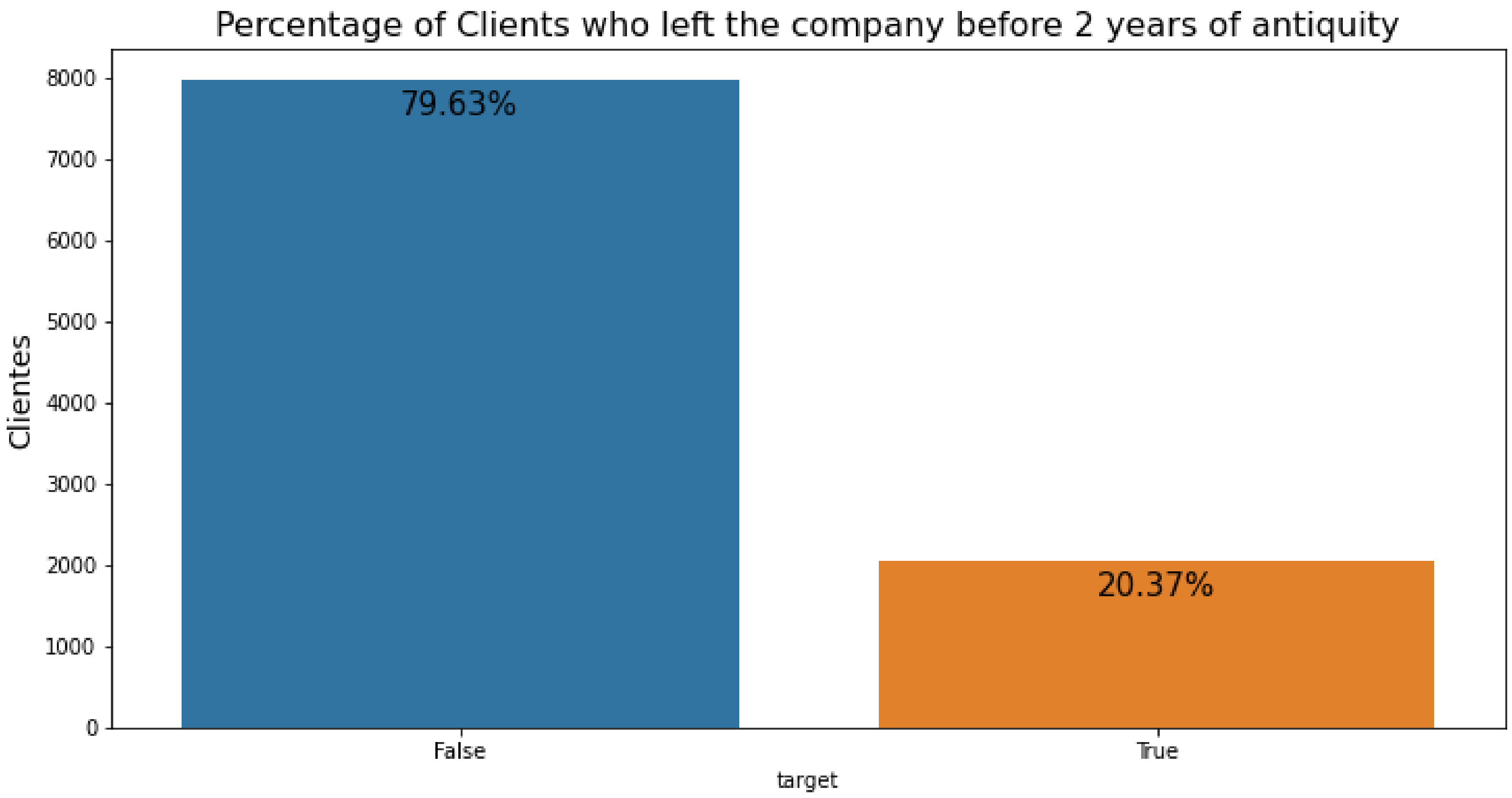
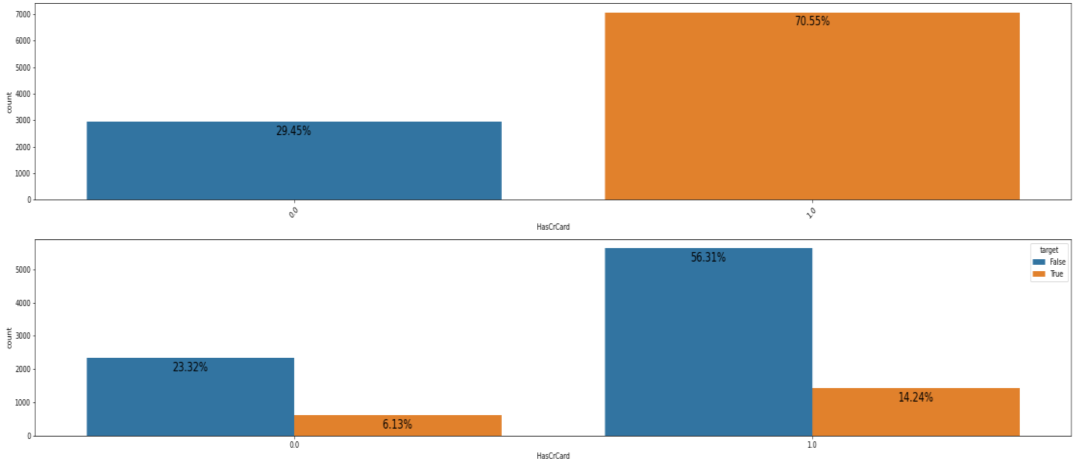
Preprocessing: Target

- For the target variable we create a category for clients who left the company before 2 years of antiquity.
- We have a highly imbalanced data set.

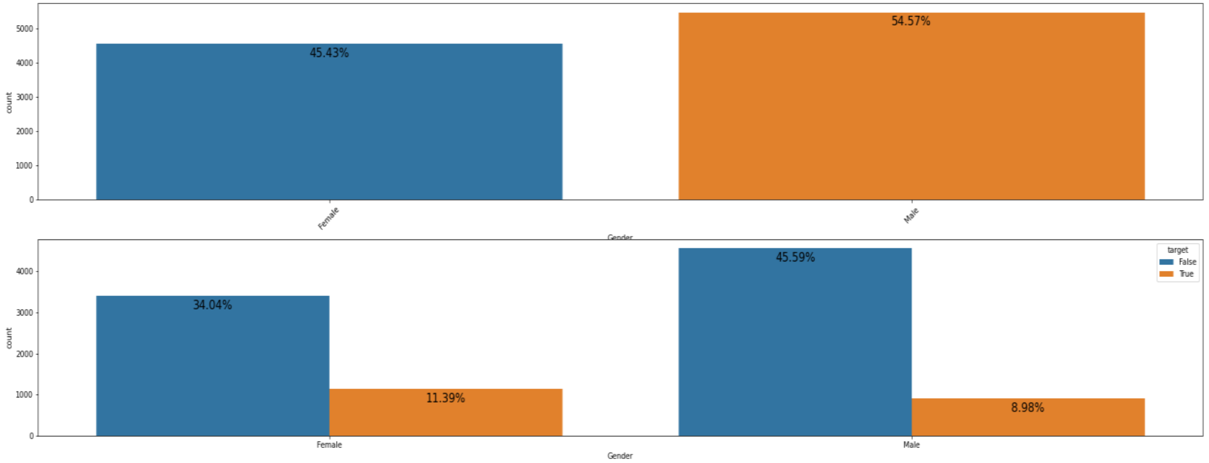


Some relations of other variables

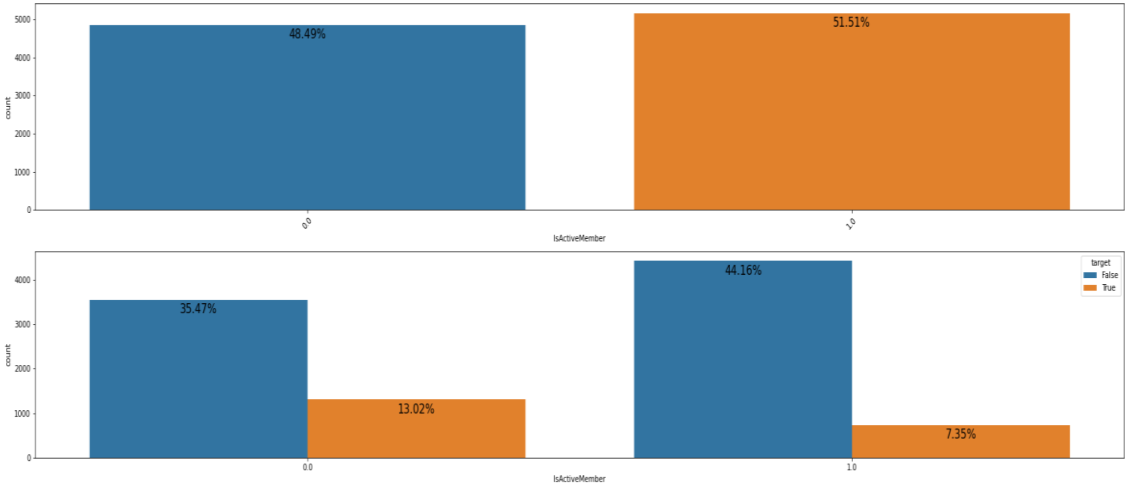
HasCrCard



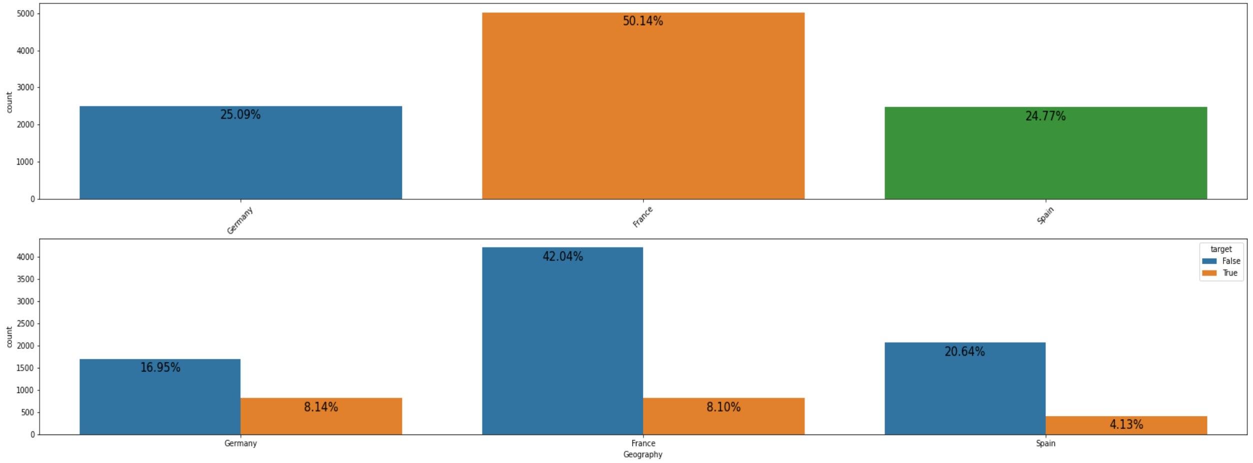
Gender



IsActiveMember

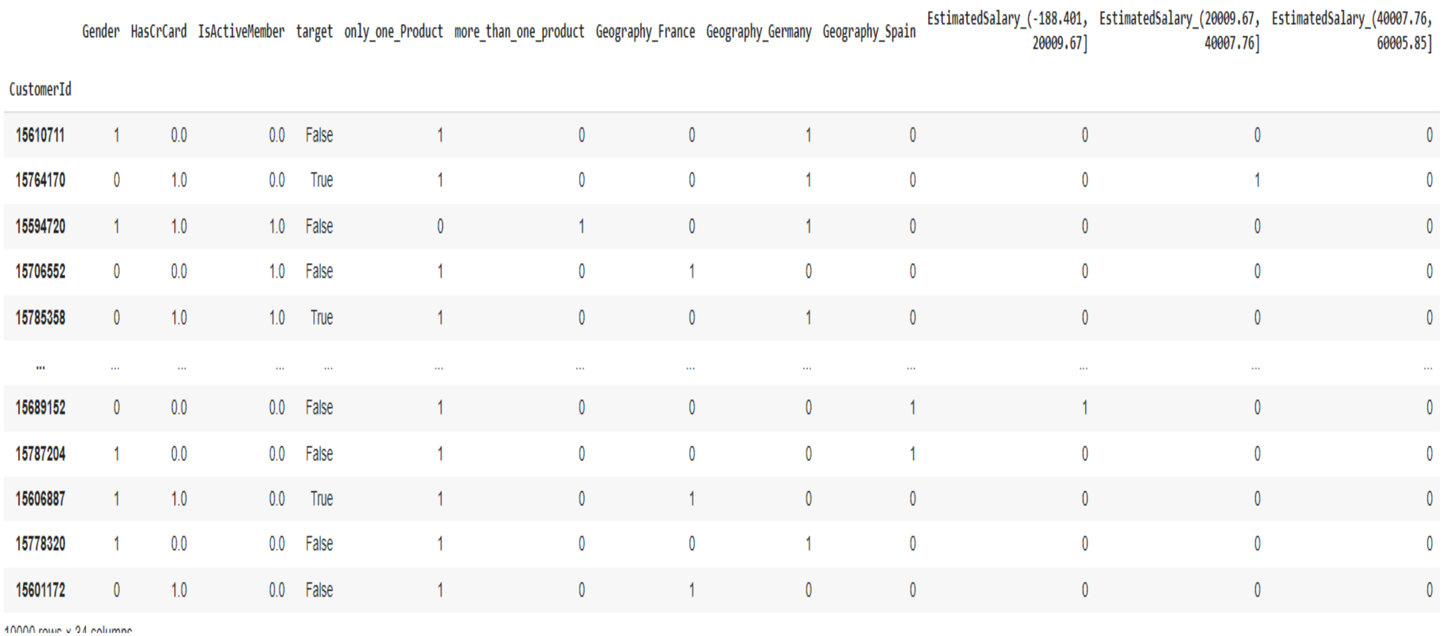


Geography



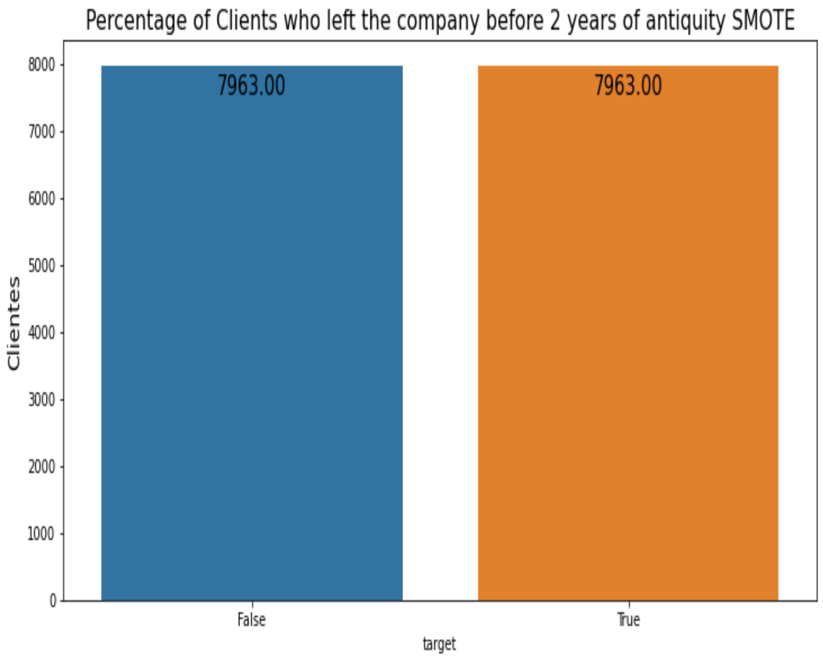
Dummy Creation and Smote

- For preprocessing we looked for more interesting relations by creating dummy variables from the numerical variables we had at first.
- Performed a SMOTE approach to solve imbalance in data.



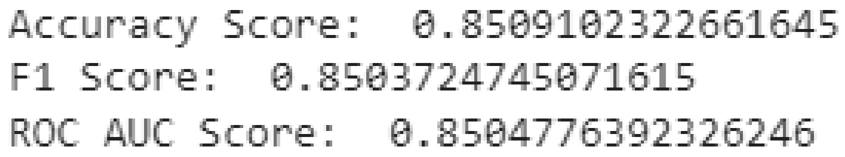
	Gender	HasCrCard	IsActiveMember	target	only_one_Product	more_than_one_product	Geography_France	Geography_Germany	Geography_Spain	EstimatedSalary_(-188.401, 20009.67]	EstimatedSalary_(20009.67, 40007.76]	EstimatedSalary_(40007.76, 60005.85]
CustomerId												
15610711	1	0.0	0.0	False	1	0	0	1	0	0	0	0
15764170	0	1.0	0.0	True	1	0	0	1	0	0	1	0
15594720	1	1.0	1.0	False	0	1	0	1	0	0	0	0
15706552	0	0.0	1.0	False	1	0	1	0	0	0	0	0
15785358	0	1.0	1.0	True	1	0	0	1	0	0	0	0
...	...	...	...	...	...	...	...	...	...	...	...	...
15689152	0	0.0	0.0	False	1	0	0	0	1	1	0	0
15787204	1	0.0	0.0	False	1	0	0	0	1	0	0	0
15606887	1	1.0	0.0	True	1	0	1	0	0	0	0	0
15778320	1	0.0	0.0	False	1	0	0	1	0	0	0	0
15601172	0	1.0	0.0	False	1	0	1	0	0	0	0	0

10000 rows x 24 columns



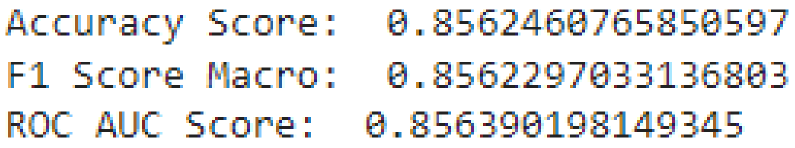
Models Results and Feature Importance

Baseline: Logistic Regression



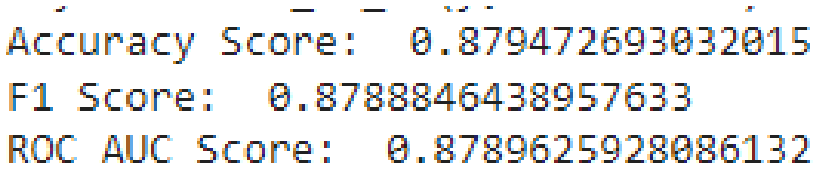
```
Accuracy Score:  0.8509102322661645
F1 Score:  0.8503724745071615
ROC AUC Score:  0.8504776392326246
```

Random Forest Classifier



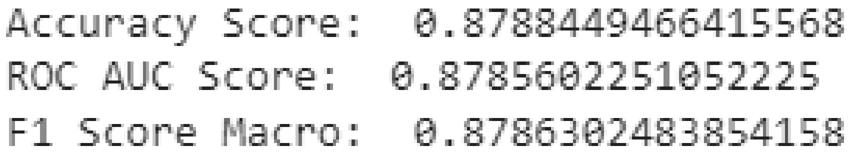
```
Accuracy Score:  0.8562460765850597
F1 Score Macro:  0.8562297033136803
ROC AUC Score:  0.856390198149345
```

Support Vector Classifier



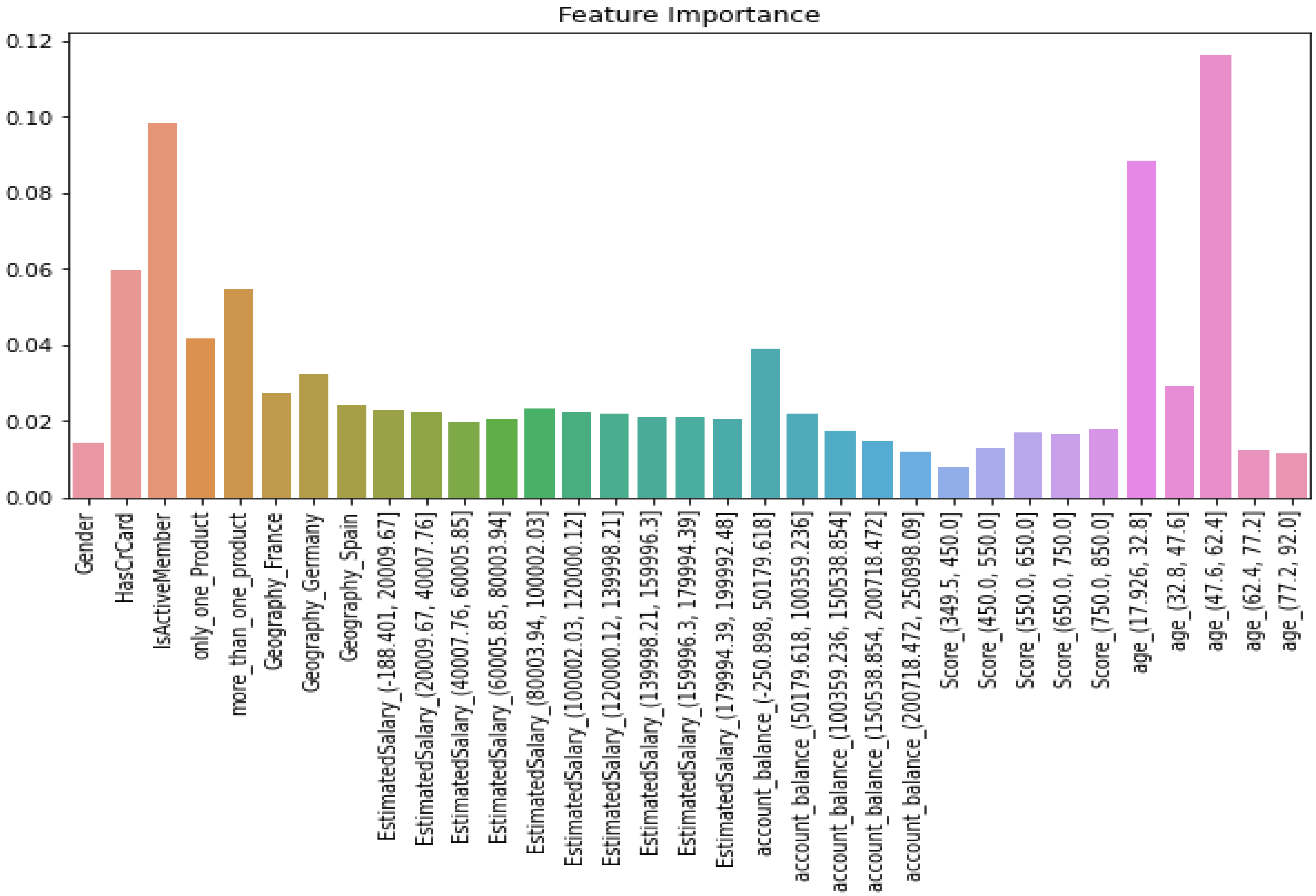
```
Accuracy Score:  0.879472693032015
F1 Score:  0.8788846438957633
ROC AUC Score:  0.8789625928086132
```

XGBoost Classifier



```
Accuracy Score:  0.8788449466415568
ROC AUC Score:  0.8785602251052225
F1 Score Macro:  0.8786302483854158
```

Feature Importance in XGBoost



Churn Client Profile

Between 18 and 33 years
And between 45 and 65 years

Active member with Credit Card
Has bought more than one product.

Is in the lowest interval of account Balance.

More likely are from Germay