Churn in Telecom

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Business Case

I will use different models to predict which telecom clients are most likely to discontinue their service. I will then compare the models and examine the most useful model for this case. My clients are cable, telegraph, telephone, or broadcasting companies.

Data Used

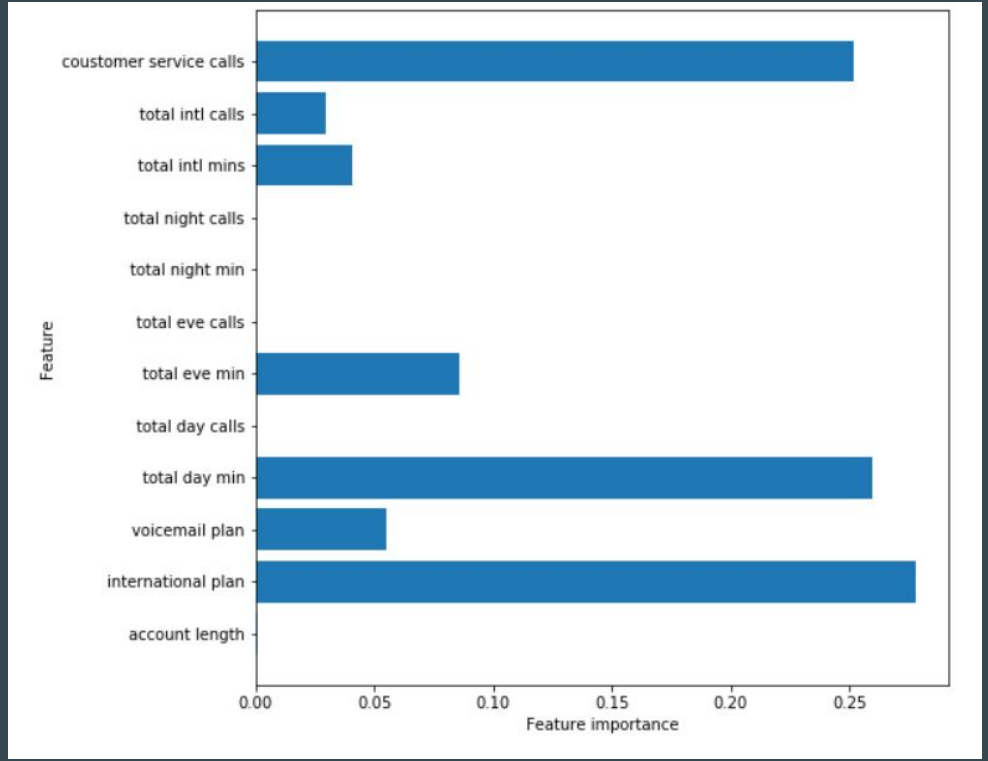
- Churn telecom data set provided:
  - 3,333 customers
  - 483 customers churned
  - Account length ranging from 1-243 days
  - Imbalanced dataset- 14:86

	account length
count	3333.000000
mean	101.064806
std	39.822106
min	1.000000
25%	74.000000
50%	101.000000
75%	127.000000
max	243.000000

EDA

Feature importance:

- International Plan
- Customer Service Calls
- Total Day Mins



Modeling

Evaluations for test:
[[511 55]
[18 83]]

	precision	recall	f1-score	support
0	0.97	0.90	0.93	566
1	0.60	0.82	0.69	101
accuracy			0.89	667
macro avg	0.78	0.86	0.81	667
weighted avg	0.91	0.89	0.90	667

Evaluations for train:
[[2089 195]
[219 2065]]

	precision	recall	f1-score	support
0	0.91	0.91	0.91	2284
1	0.91	0.90	0.91	2284
accuracy			0.91	4568
macro avg	0.91	0.91	0.91	4568
weighted avg	0.91	0.91	0.91	4568

Random Forest

Evaluations for test:
[[548 18]
[21 80]]

	precision	recall	f1-score	support
0	0.96	0.97	0.97	566
1	0.82	0.79	0.80	101
accuracy			0.94	667
macro avg	0.89	0.88	0.88	667
weighted avg	0.94	0.94	0.94	667

Evaluations for train:
[[2279 5]
[29 2255]]

	precision	recall	f1-score	support
0	0.99	1.00	0.99	2284
1	1.00	0.99	0.99	2284
accuracy			0.99	4568
macro avg	0.99	0.99	0.99	4568
weighted avg	0.99	0.99	0.99	4568

Grid Search

Modeling

- Random Forest is less affected by an imbalanced data set
- Random forest builds multiple decision trees and merges them together to get a more accurate and stable prediction
- Instead of searching for the most important feature while splitting a node, it searches for the best feature among a random subset of features. This results in a wide diversity that generally results in a better model.

Recommendations

Based on the data it seems that customers with international plans, the ones making the most customer service calls, and the those who are using the most mins a day are those who are most likely to discontinue service.

- Perhaps focusing on improving customer service representative training may aid in reducing churn rate.
- Also providing better plans for those who make international calls and long calls may also help reduce churn rate.

Thank You!

Repo: https://github.com/asherkhan7/churn-in-telecom.git