SyriaTel Customer Analysis

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Key Questions

1. Which plans are customers satisfied with?

2. Which factors lead to service discontinuations?

3. How should SyriaTel retain customers?

1 . Data

Key variables in our dataset

➜ International plan (yes/no)

➜ Voicemail plan (yes/no)

➜ Number of calls

➜ Number of service calls

➜ Daily charge

Initial steps

➢ Ran initial linear regression
➢ Dropped unnecessary columns
   ○ Area code
   ○ Account length
   ○ Statistical insignificance
➢ Class imbalance (14% churn)

2. Logistic regression

➢ Multicollinearity problems

➢ Train/test split (75%/25%)

	Correlation
Pairs	
(total_day_charge, total_day_minutes)	1.000000
(total_eve_charge, total_eve_minutes)	1.000000
(total_night_charge, total_night_minutes)	0.999999
(total_intl_charge, total_intl_minutes)	0.999993
(number_vmail_messages, voice_mail_plan)	0.956927

Logistic regression results

	coef	std err	z	P>|z|	[0.025	0.975]
const	-8.5299	0.708	-12.044	0.000	-9.918	-7.142
international_plan	2.0423	0.145	14.064	0.000	1.758	2.327
voice_mail_plan	-0.9382	0.145	-6.474	0.000	-1.222	-0.654
total_day_calls	0.0033	0.003	1.187	0.235	-0.002	0.009
total_day_charge	0.0763	0.006	11.986	0.000	0.064	0.089
total_eve_calls	0.0011	0.003	0.381	0.703	-0.004	0.006
total_eve_charge	0.0849	0.013	6.322	0.000	0.059	0.111
total_night_calls	0.0004	0.003	0.154	0.877	-0.005	0.006
total_night_charge	0.0809	0.025	3.283	0.001	0.033	0.129
total_intl_calls	-0.0909	0.025	-3.645	0.000	-0.140	-0.042
total_intl_charge	0.3229	0.075	4.281	0.000	0.175	0.471
customer_service_calls	0.5143	0.039	13.125	0.000	0.438	0.591

Test Set Accuracy: 0.6823
Test Set Recall: 0.7304
Test Set Precision: 0.2642
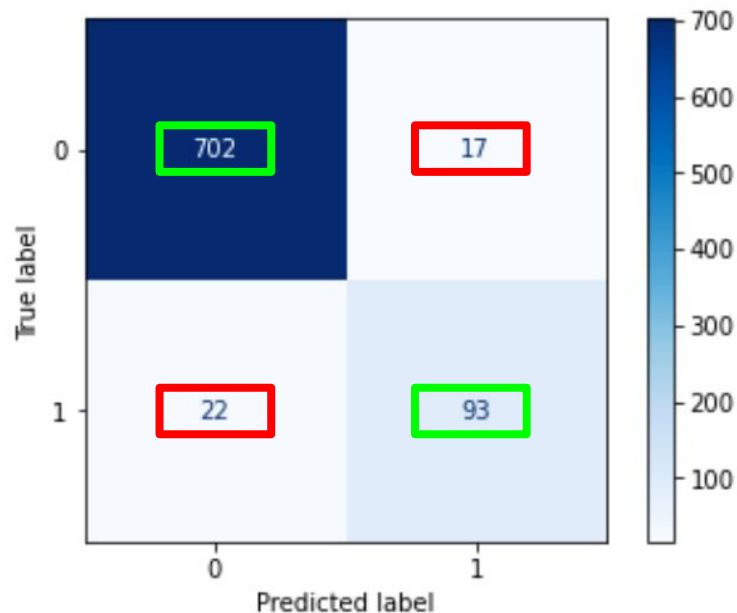Test Set F1-Score: 0.3880

Test Set Confusion Matrix
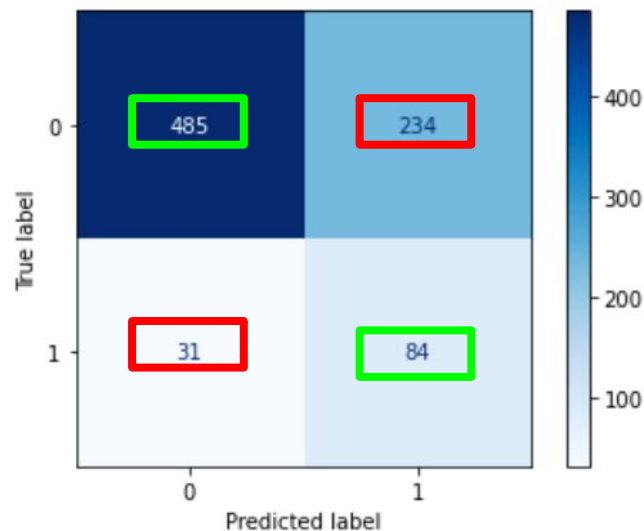
3. Final model decision

- ➤ Random forest regression
  - ○ Uses decision trees
  - ○ Two key sections
    - ■ Bagging
    - ■ Subspace sampling
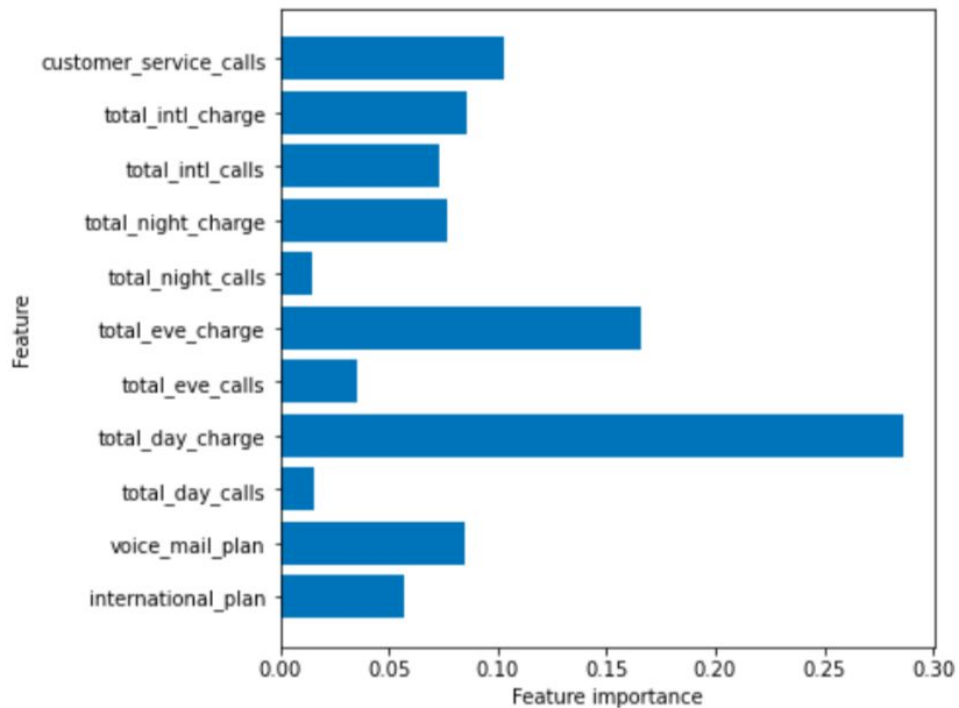 - ○ Resistant to noise

Final model

- Test accuracy: .95
- Test recall: .81
- Test precision: .84
- Test F1: .83

Test Set Confusion Matrix

Random forest notes

4. Recommendations

➤ Total daily charge

➤ Delve into international plans

➤ Customer service calls

  ○ Quality assurance

  ○ Steps to reduce these

Thank you for watching!

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https://github.com/jresis/SyriaTelAnalysis