Telecom Churn Analysis and Prediction

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Churn.xlsx   0.6MB   ✕

Dataset Overview

	Unnamed: 0	state	area.code	account.length	voice.plan	voice.messages	intl.plan	intl.mins
0	1	KS	area_code_415	128	yes	25	no	10
1	2	OH	area_code_415	107	yes	26	no	13.7
2	3	NJ	area_code_415	137	no	0	no	12.2
3	4	OH	area_code_408	84	no	0	yes	6.6
4	5	OK	area_code_415	75	no	0	yes	10.1

Data Cleaning

Missing values after cleaning:

	0
state	0
area.code	0
account.length	0
voice.plan	0
voice.messages	0
intl.plan	0
intl.mins	0
intl.calls	0
intl.charge	0
day.mins	0

Data Overview

Summary Statistics:

	account.length	voice.messages	intl.mins	intl.calls	intl.charge	day.mins	day.calls	day.charge
count	4,969	4,969	4,969	4,969	4,969	4,969	4,969	4,969
mean	100.2067	7.7549	10.2642	4.4331	2.7719	180.3062	100.0219	30.6526
std	39.6955	13.5457	2.762	2.4595	0.7457	53.9312	19.836	9.1683
min	1	0	0	0	0	0	0	0
25%	73	0	8.5	3	2.3	143.7	87	24.43
50%	100	0	10.3	4	2.78	180.1	100	30.62
75%	127	17	12	6	3.24	216.2	113	36.75
max	243	52	20	20	5.4	351.5	165	59.76

Churn Distribution:

churn	count
no	4,264
yes	705

Data Visualization
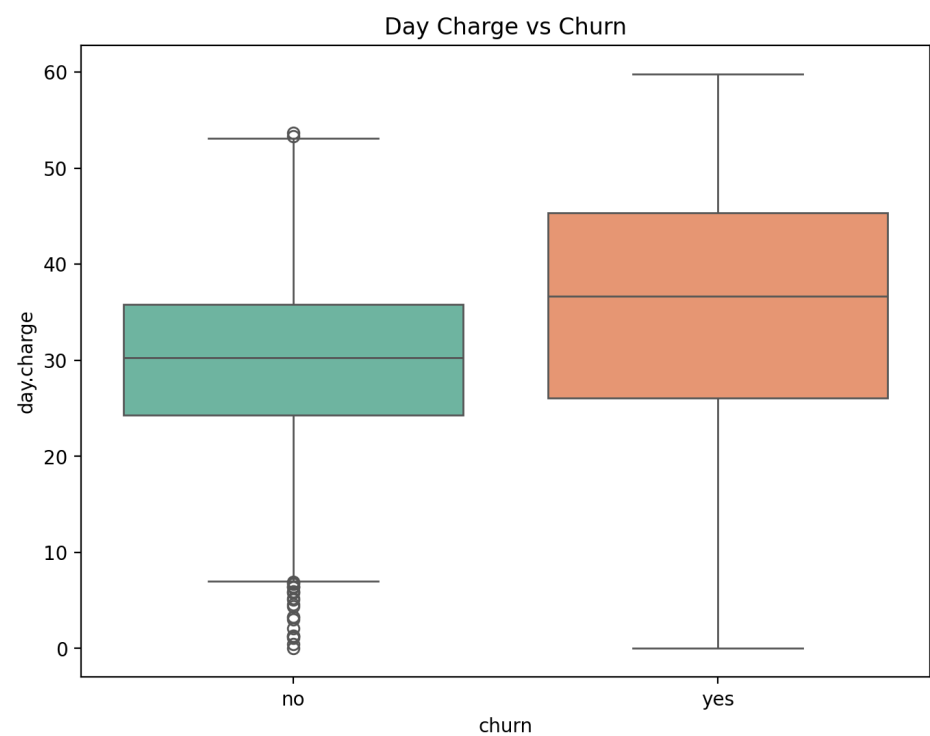
Correlation Heatmap:
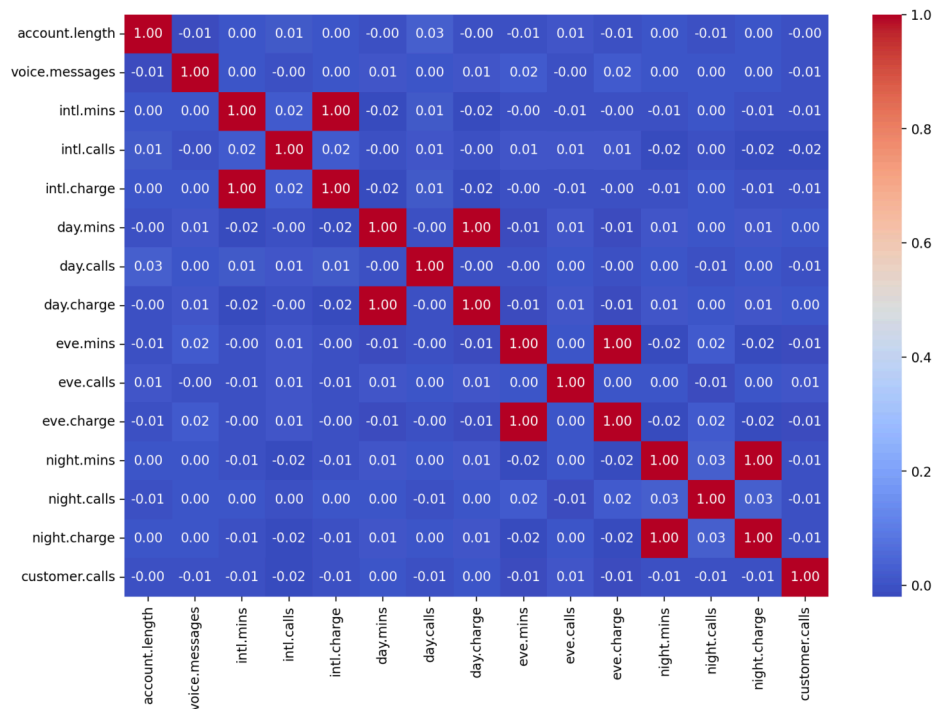
Churn Rate by State:
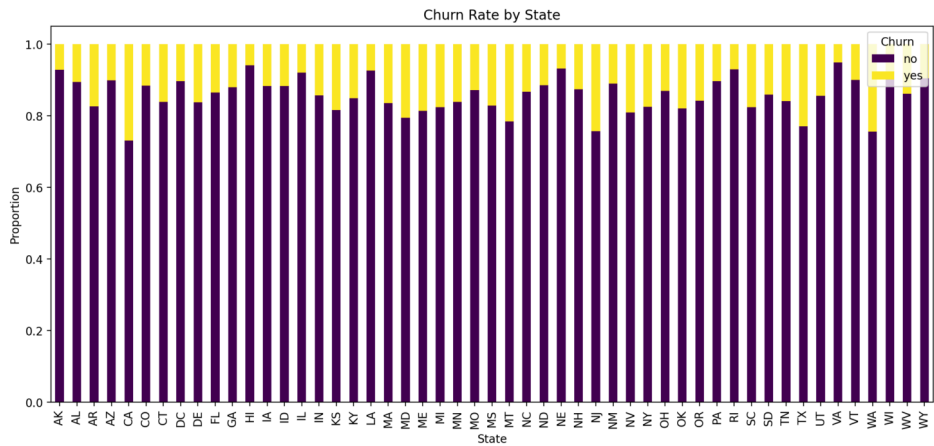
Boxplot: Day Charge vs Churn:

Day Charge vs Churn

Feature Engineering

Data after Feature Engineering:

	state	area.code	account.length	voice.plan	voice.messages	intl.plan	intl.mins	intl.calls
0	KS	area_code_415	128	1	25	0	10	3
1	OH	area_code_415	107	1	26	0	13.7	3
2	NJ	area_code_415	137	0	0	0	12.2	5
3	OH	area_code_408	84	0	0	1	6.6	7
4	OK	area_code_415	75	0	0	1	10.1	3

Model Building and Evaluation

Select test size for splitting the data:

0.20

0.10   0.50

Select number of estimators for RandomForest:

100

50   200

Model Accuracy: 0.954728370221328

Confusion Matrix:

	0	1
	829	4
	41	120

Classification Report:

precision recall f1-score support

0	0.95	1.00	0.97	833
1	0.97	0.75	0.84	161

```
        accuracy                          0.95        994
```

macro avg 0.96 0.87 0.91 994 weighted avg 0.96 0.95 0.95 994

Model Performance Feedback

Great model performance! Consider fine-tuning hyperparameters for further improvement.

macro avg 0.96 0.87 0.91 994 weighted avg 0.96 0.95 0.95 994