
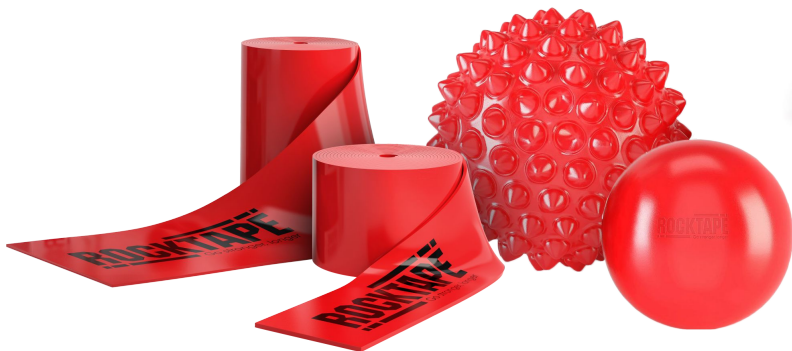
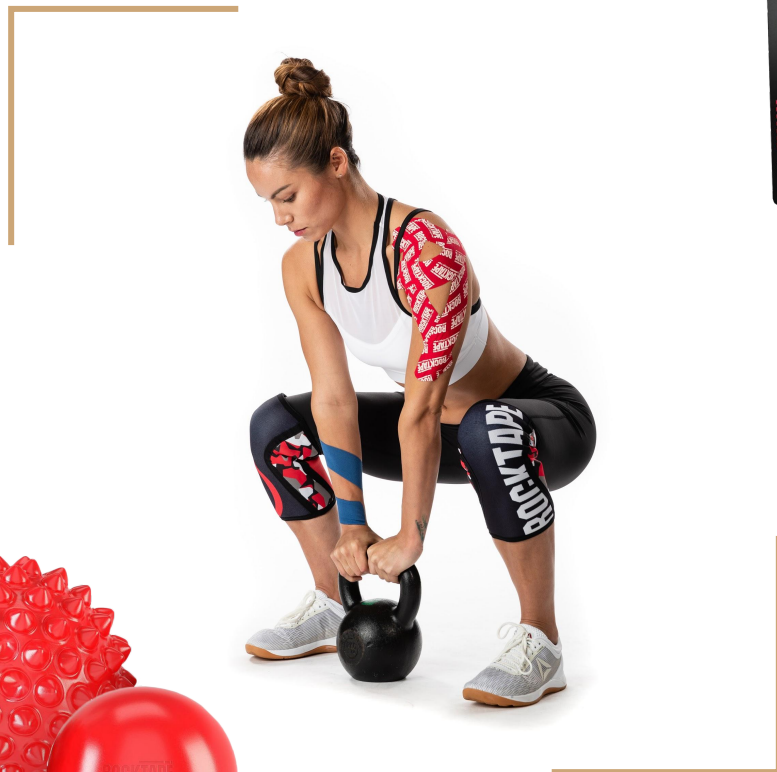


Predicting Churn and Analyzing Customer Lifespans



Dominique Vandendries
April 2019



Customer Data

Who you are?
When you joined?

Order Data

What you ordered?
What you spent on shipping?

Marketing Data

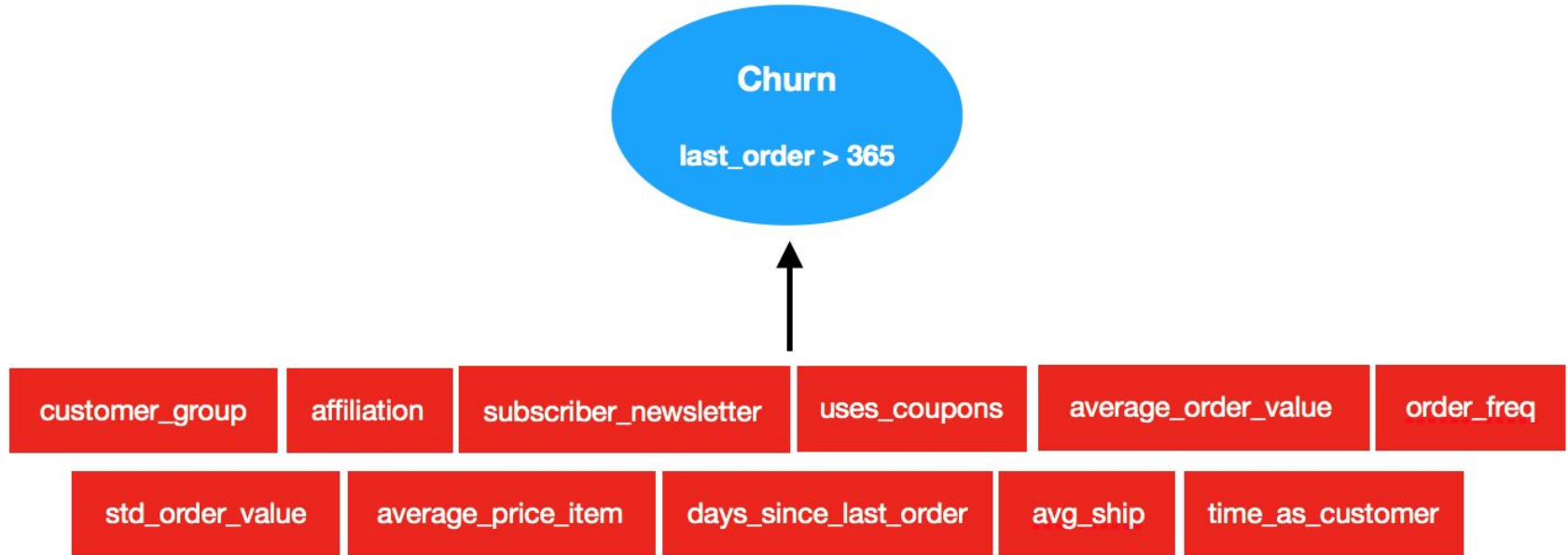
Subscribe to newsletter?
MailChimp?

My Project Data

```
graph LR; A[Customer Data] --> D[My Project Data]; B[Order Data] --> D; C[Marketing Data] --> D;
```

The diagram illustrates a data integration process. On the left, three colored rounded rectangles represent different data sources: a blue box for 'Customer Data', a pink box for 'Order Data', and an orange box for 'Marketing Data'. Each box contains specific data points. Arrows from each of these three boxes point towards a single red rounded rectangle on the right labeled 'My Project Data', which is underlined. This indicates that all three data sources are being consolidated into a single project data set.

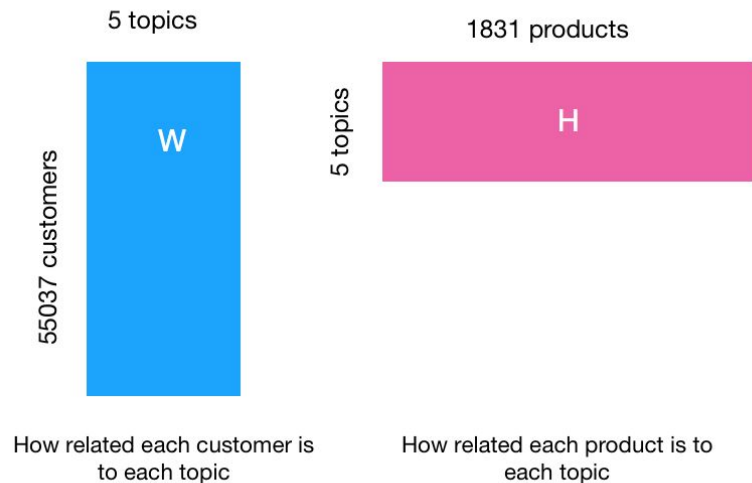
Initial feature extraction



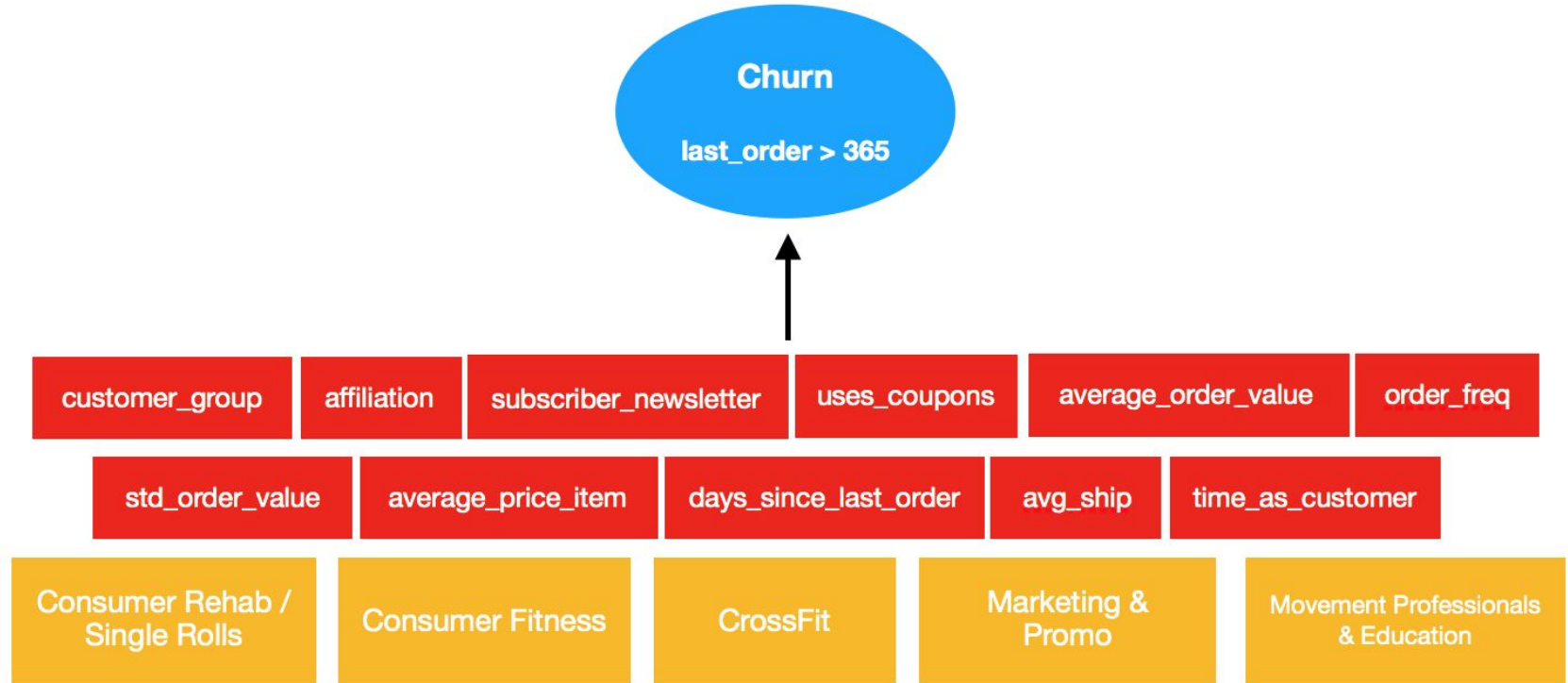
Non-negative Matrix Factorization

	Widget	Thingy	Gizmo
Larry	0	5	0
Claire	0	2	0
Martin	1	0	2

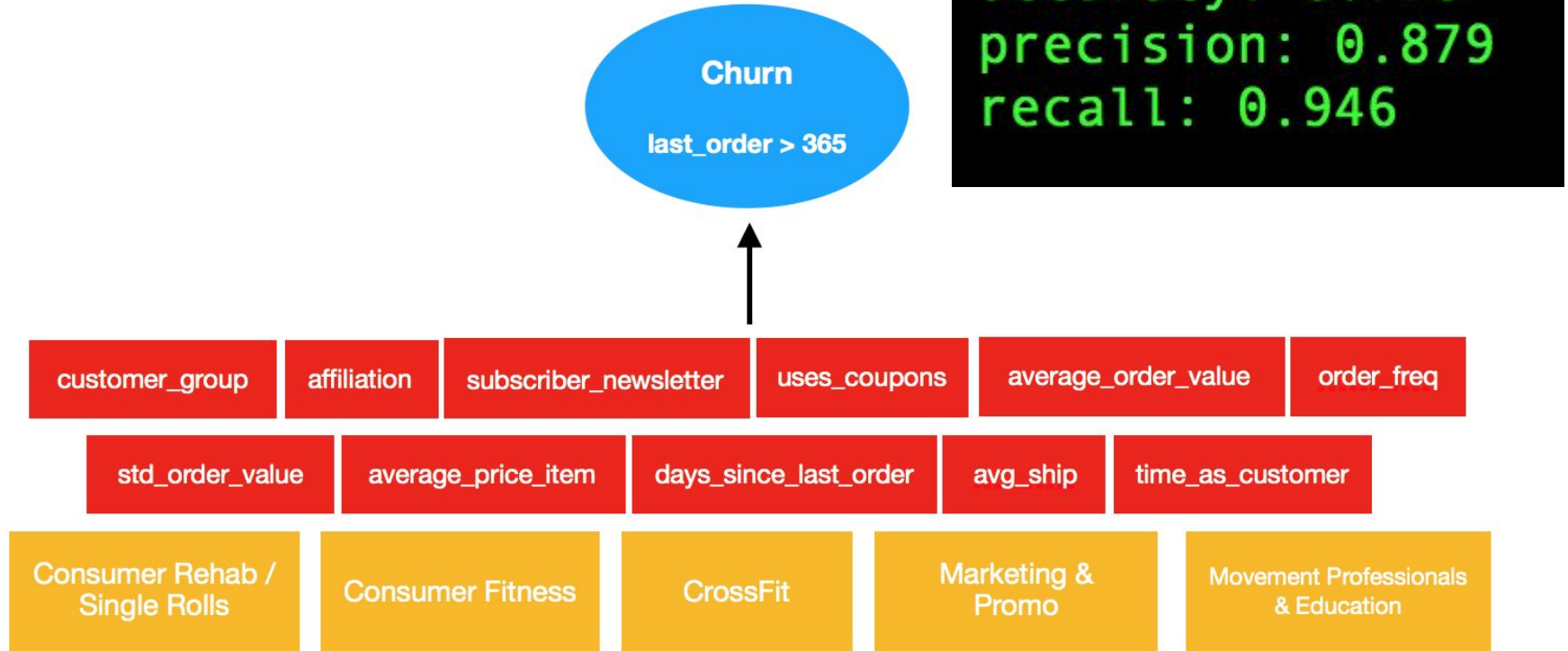
decompose



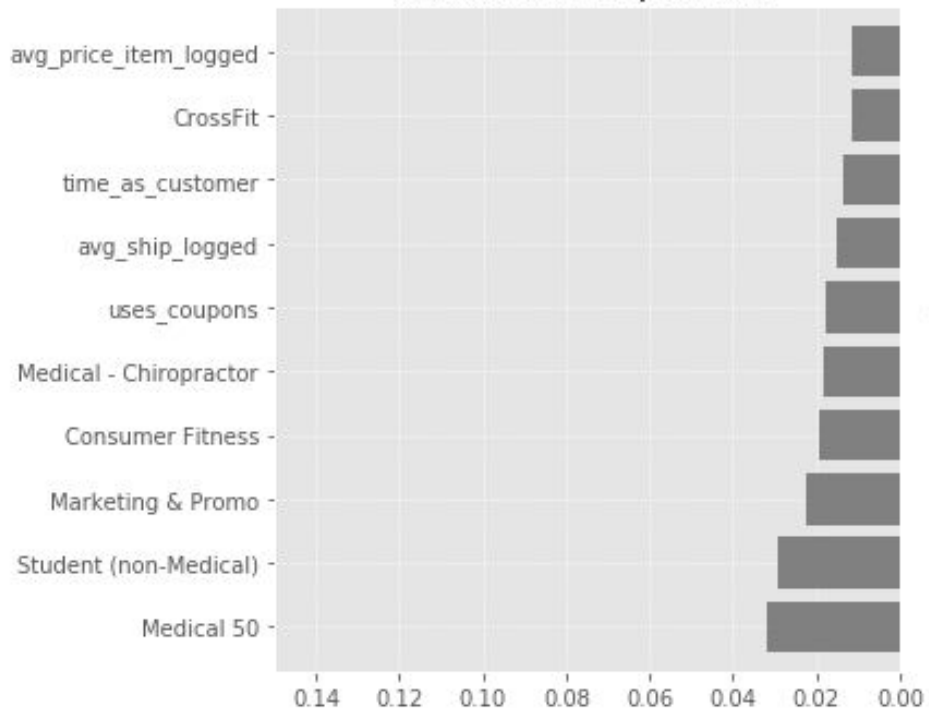
Random Forest



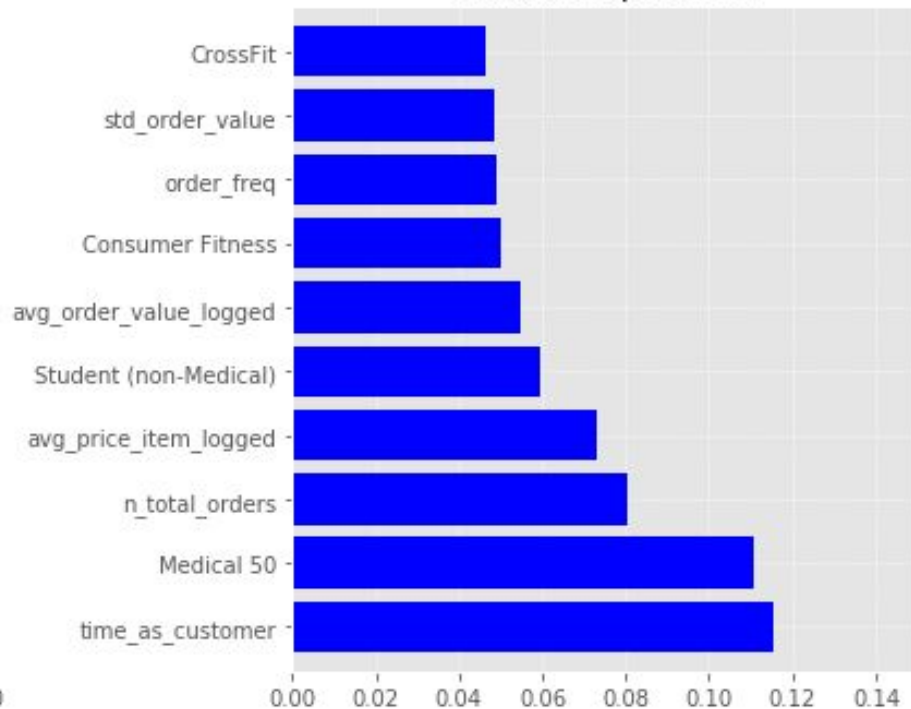
Random Forest



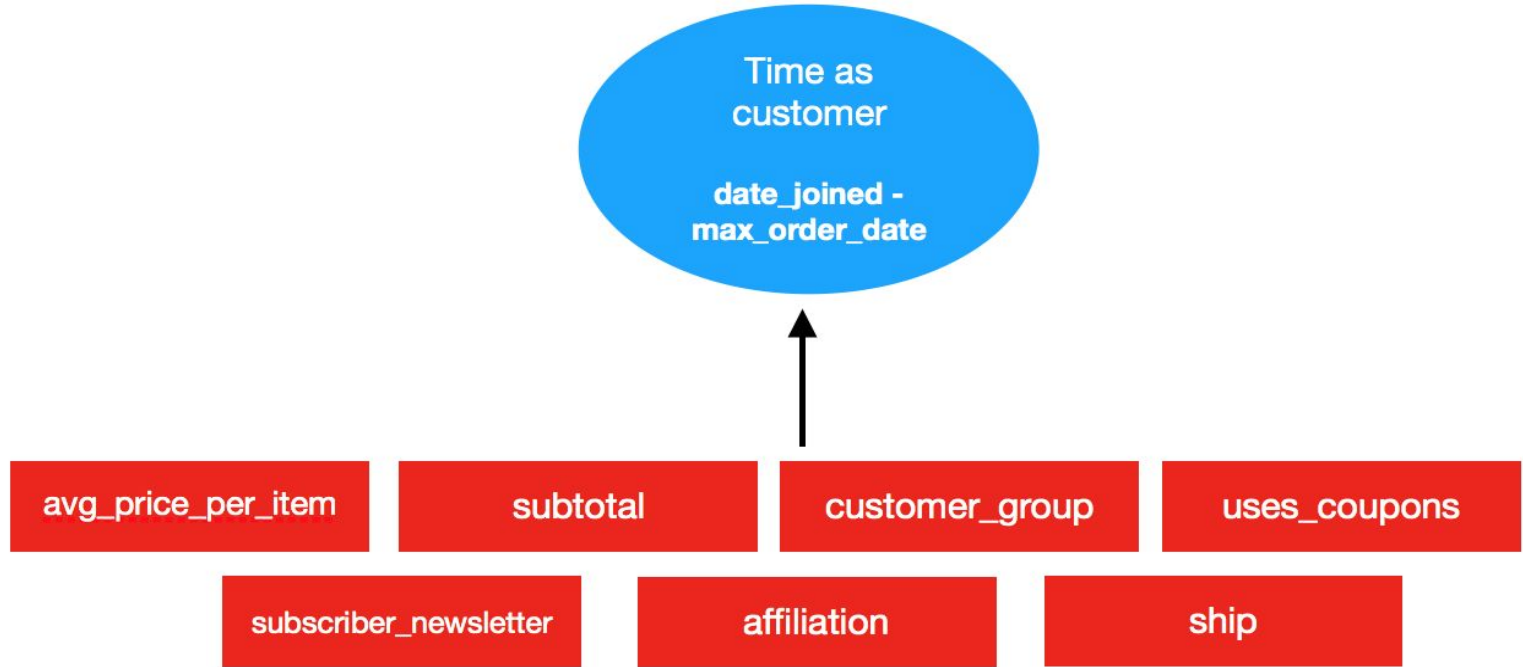
Permutation Importance



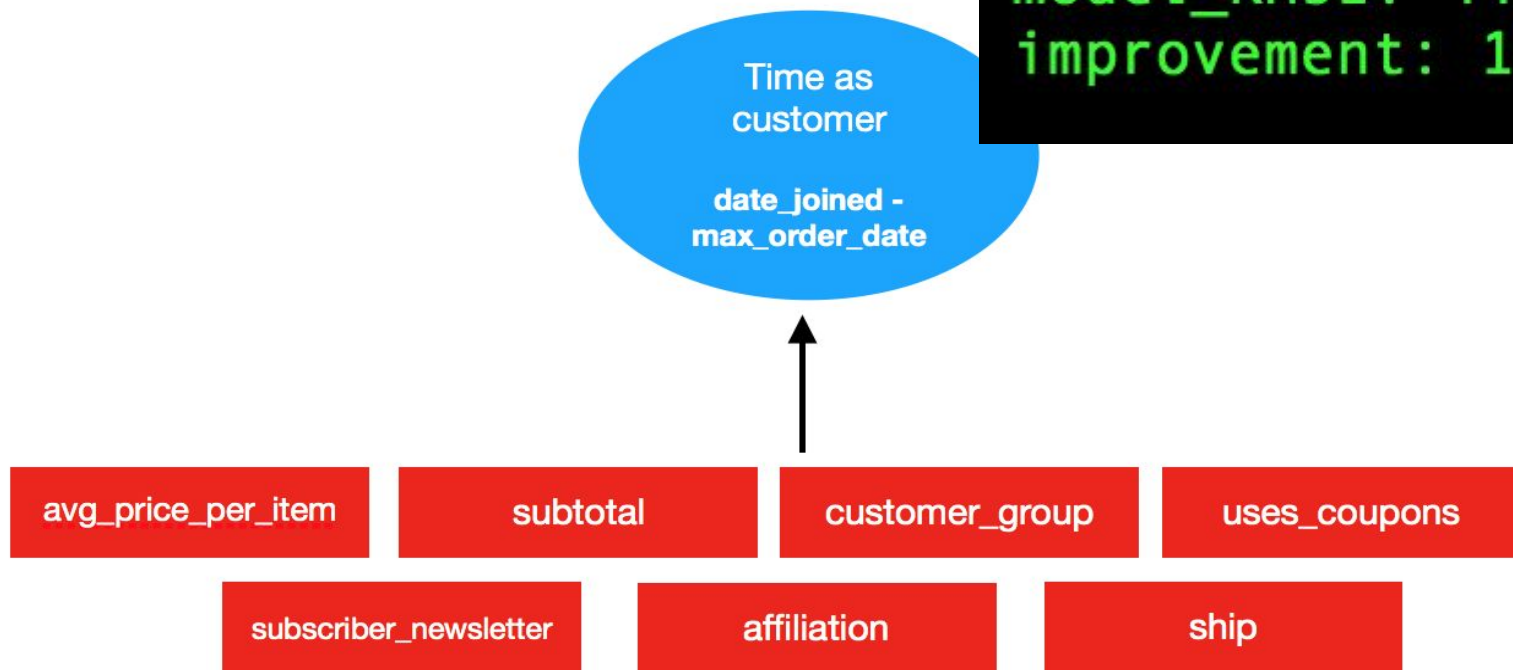
Feature Importance



Cold Start

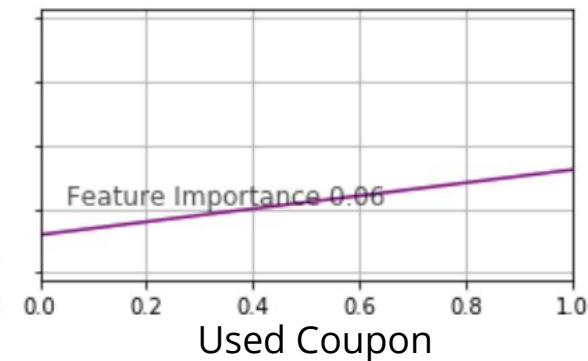
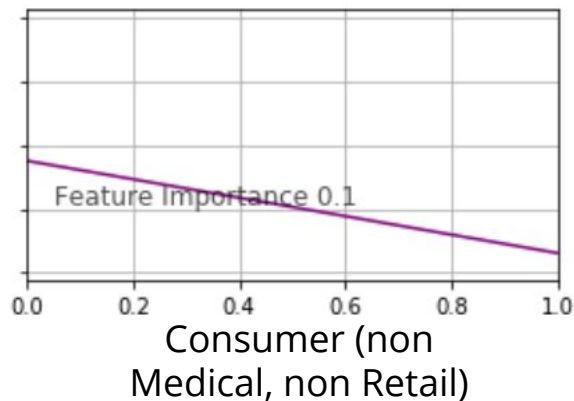
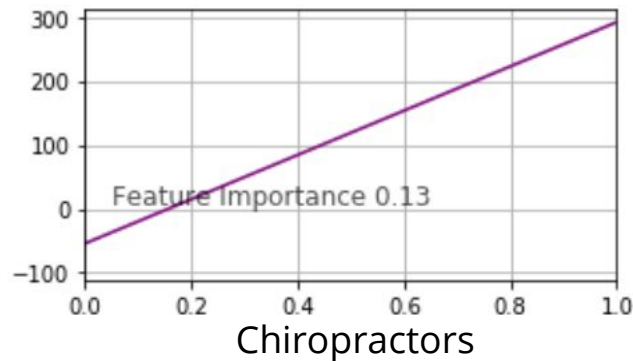
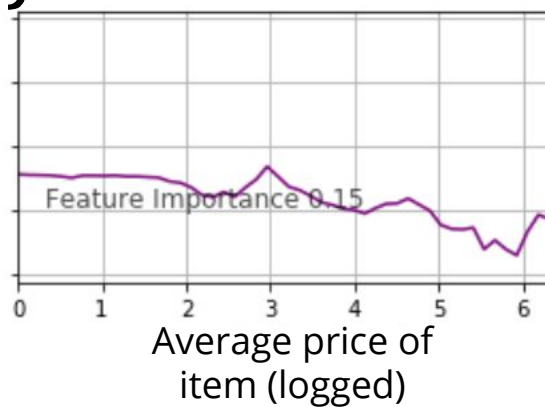
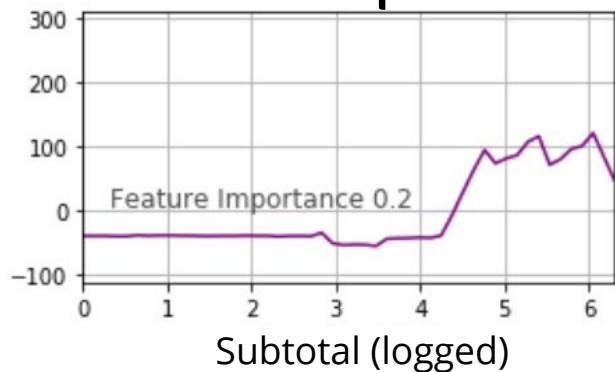


Cold Start



```
baseline_RMSE: 524  
model_RMSE: 442  
improvement: 15%
```

Partial Dependency Plots



Strongest predictors of churn

The strongest predictors of churn came from **customer type**, not their purchasing behavior

People who **receive testers/samples** often don't follow through as customers

Students tend to churn at a higher rate than other factions

Strongest predictors of lifespan

New **chiropractors** are most likely to stick around longer

Using a **coupon** with a first order positively correlates with lifespan

Buying expensive items on first purchase contributes negatively to lifespan

Free/reduced shipping doesn't increase lifespan

WebApp Demonstration

