

# ALGORITHM SHOOT-OUT FOR THE BEST RECOMMENDATIONS

## Test and Learn for Optimal Performance

With brand giants like Amazon, Netflix, and YouTube setting the pace for effective personalization, it's no surprise marketers across industries are looking to improve their own personalized recommendations for higher retention rates. To complicate matters, there is a myriad of statistical approaches to choose from and picking the right one can be challenging. This was the case for our retail client who was in serious need of a recommendation engine upgrade.

### ALGORITHM SHOOT-OUT

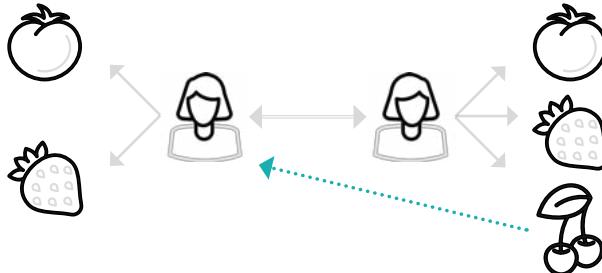
To facilitate a proper assessment, 89 Degrees' analytics team scoped out a project to test three of today's more popular approaches against a year's worth of sales transaction and click stream data. We tested two iterations of collaborative filtering, both item and customer based, along with a product associations algorithm, which evaluated correlations across all possible product pairings.

### 3 ALGORITHMS FOR TESTING

1

#### Customer-Based Collaborative Filtering

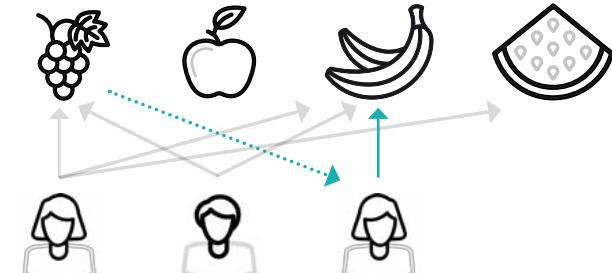
Products recommended to a consumer are based on an evaluation of products purchased by similar consumers



2

#### Item-Based Collaborative Filtering

Products recommended to a consumer are based on patterns of products that are purchased together



3

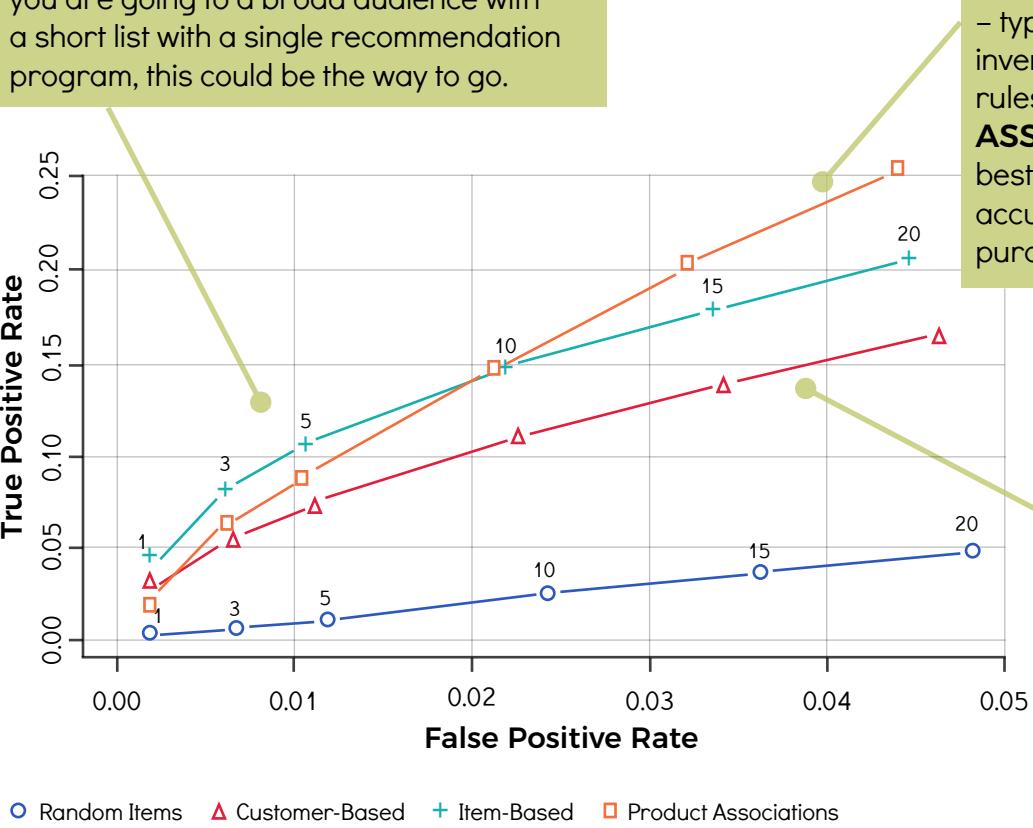
#### Product Associations

Find associations and correlations across the different products that customers buy. Quantify the association by 'Lift'



Models were developed and their prediction accuracy scored compared to actual customer purchase activity according to their true positive and false positive rates.

**ITEM-BASED** collaborative filtering works best on the first few recommendations. If you are going to a broad audience with a short list with a single recommendation program, this could be the way to go.



For applications where more recommendations are needed – typically seen in cases where inventory or seasonal business rules limit availability – **PRODUCT ASSOCIATIONS** could be the best approach due to higher accuracy across the entire purchase spectrum.

**CUSTOMER-BASED** collaborative filtering is less powerful than the item-based approaches. In this test, evaluating at the person level introduced too much variability, lowering accuracy across the board.

○ Random Items    △ Customer-Based    + Item-Based    □ Product Associations

## RESULTS

Determining the best approach really depends on the intended application. Where customer-based collaborative filtering consistently underperformed, item-based collaborative filtering proved to be more effective up to 10 items, while the product associations model performed better when recommending more than 10 items. The takeaways from this project:

- Spend the time up front to evaluate your purchase dynamics and determine which approach might work best
- Start small with a proof of concept; this will help overcome inherent organizational concerns to implementing what seems like a “black box” solution
- Think Big! Maximize impact by scaling across all channels with an unified modeling approach

89 Degrees' analytics team is well practiced in developing and executing test and learn projects that can unlock tangible value from any marketing ecosystem. Visit our [Advanced Marketing Analytics](#) practice area for details on our range of services, including Opportunity Analysis, Customer Journey Analytics, Personalization, and more.



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