

DJ consulting  
2020.07

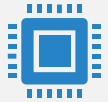
# RECOMMENDATION SYSTEM PROJECT UPDATE



The target is to build a product recommendation system for gracioustyle



A model development plan has been set up to implement item-based collaborated filtering methods



We are building an end-to-end modelling pipeline to incorporate a variety of algorithms to target the best model performance

## PROJECT BACKGROUND

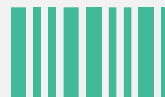
# DATA FINDINGS



**Product** targeting is more important than brand and colour



Product type level is very high (a single product type contains many products underneath). This means type level targeting is not able to locate precise/specific products



As a result, we are testing our model at both product ID and product type level, knowing that product contains information of type, brand and colour

# OUR APPROACH

Since purchase data is implicit rather than explicit (ratings), we need to apply implicit collaborative filtering methods

The classic implicit CF methods include Alternating Least Squares, Bayesian Personalized Ranking, Logistic Matrix Factorization, and K-nearest neighbor

A complete model building process is set up that steps through data processing, threshold cut-off, user-product matrix transformation, train/testing sets split, algorithm training, hyper parameters tuning with cross validation, best model selection and accuracy evaluation

Hyper tuned all the algorithms and select the best one as the final model

# EVALUATION METRIC

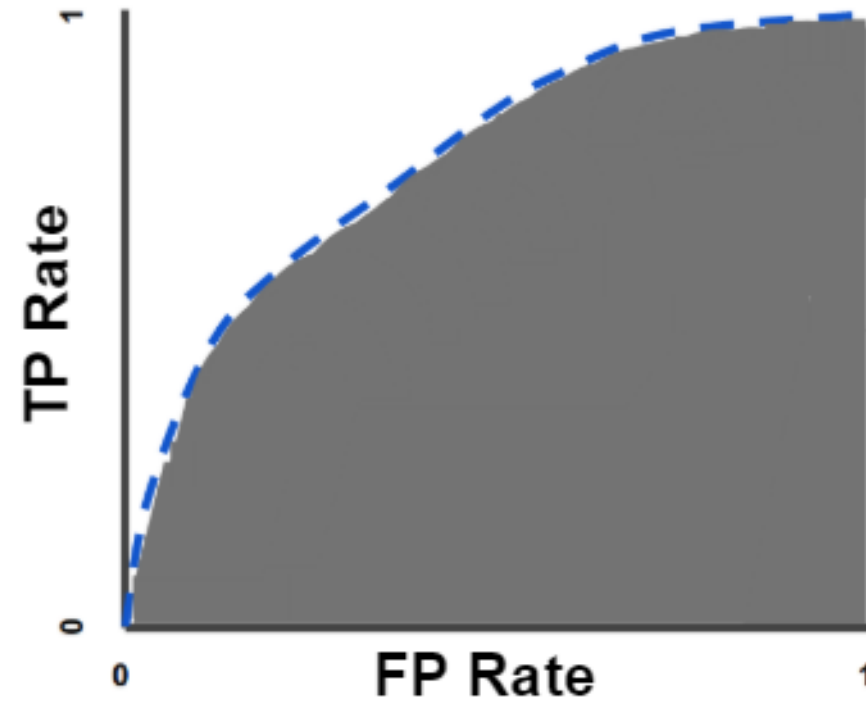
AUC is one of the most important evaluation metrics to measure classification accuracy

AUC represents the probability that a random positive observation (e.g. purchase) is positioned to the right of a random negative observation (e.g. non-purchase).

AUC ranges in value from 0 to 1. A model whose predictions are 100% wrong has an AUC of 0.0; one whose predictions are 100% correct has an AUC of 1.0.

## AUC: Area Under the ROC Curve

**AUC** stands for "Area under the ROC Curve." That is, AU ROC curve (think integral calculus) from (0,0) to (1,1).





As a benchmark, we use the most popular products as the comparison baseline. Popularity is ranked based on historical purchase quantities



We compare our recommendation model performance with the 'most popular' baseline



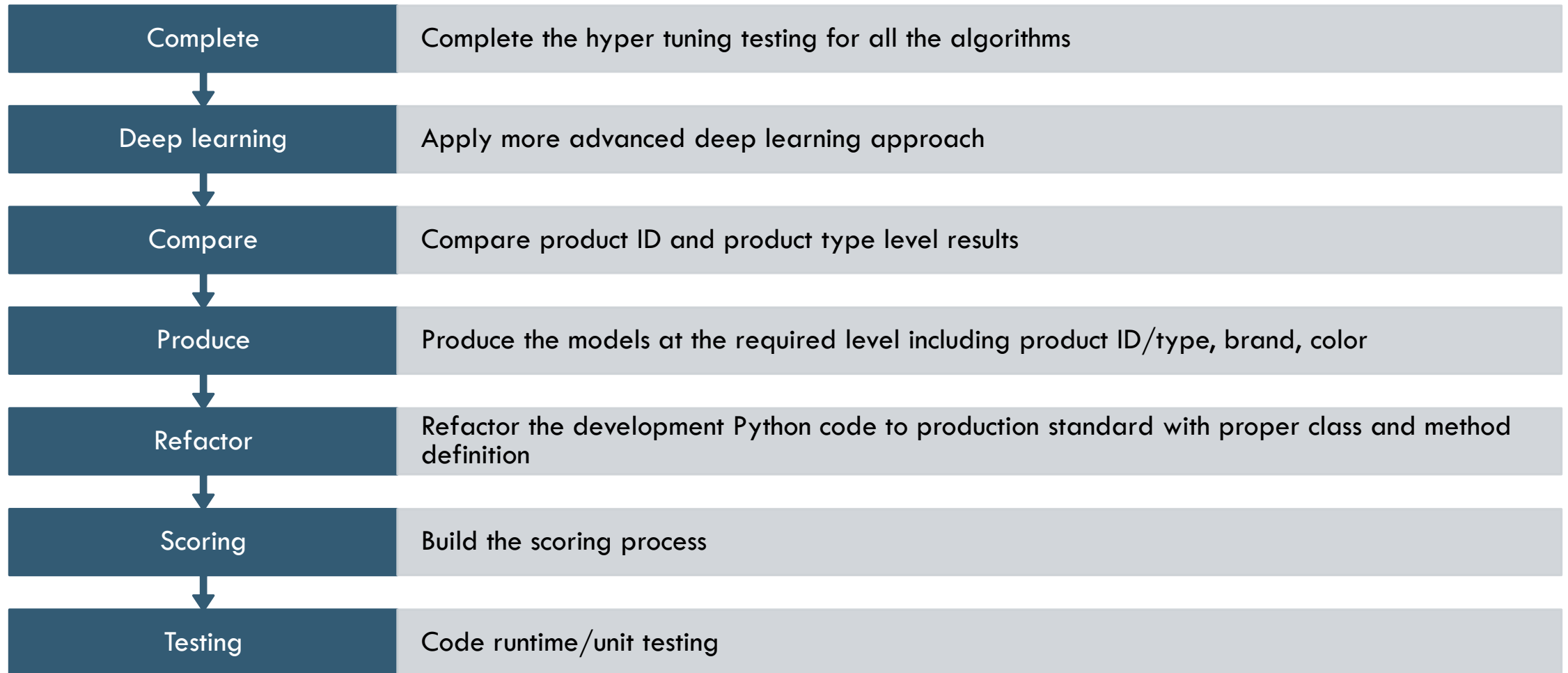
The raw ALS model achieved AUC **83.4%** compared with the baseline **73.1%**. This means our personalization algorithm beats the 'most popular' by **>10%**



There's still room for further model performance lifting. Potentially, the BPR model may achieve even better result subject to further model tuning

# RAW EVALUATION RESULT

# NEXT STEPS



# DECISIONS



Decide which steps we should prioritize, and which can be parked



Estimate the time for project completion