EVALUATION METRIC

MAP@K

$$AveP = \frac{\sum_{k=1}^{K}(Precision@(k) \times rel(k)))}{\text{number of relevant items}} \rightarrow MAP@K = \frac{\sum AveP(K)}{\text{number of users}}$$

PRECISION@K

$$\text{precision@k} = \frac{|\{\text{relevant items}\} \cap \{\text{recommended items}\}|}{|\{\text{recommended items}\}|}$$

RECALL@K

$$\text{recall@k} = \frac{|\{\text{relevant items}\} \cap \{\text{recommended items}\}|}{|\{\text{relevant items}\}|}$$

F-SCORE

$$F = \frac{2 \cdot precision \cdot recall}{(precision + recall)}$$

RESULT – ALGORITHM ON TRANSACTION DATA

2016-08-01 ~ 2017-08-01 > 2017-11-01				Overall							
----------	ALS ProductID	ALS Agg	ALS Agg Color	FP ProductID	FP Agg	FP Agg Color		K-nn ProductID	K-nn Agg	k-NN Agg Color	
MAP:							Cosine, K=20	TF-IDF, K=100	TF-IDF, k=100	TF-IDF, k=100	
MAP@1	0.17%	4.96%	2.29%	0.14%	2.04%	1.60%	0.11%	0.25%	2.17%	0.81%	
MAP@3	0.19%	4.32%	2.07%	0.10%	1.83%	1.49%	0.10%	0.16%	1.90%	0.71%	
MAP@5	0.20%	4.40%	2.14%	0.09%	1.87%	1.56%	0.10%	0.16%	2.04%	0.74%	
MAP@10	0.21%	4.60%	2.30%	0.09%	1.93%	1.64%	0.10%	0.17%	2.23%	0.80%	
MAP@20	0.23%	4.83%	2.45%	0.09%	1.95%	1.67%	0.11%	0.17%	2.38%	0.87%	
MAP@30	0.24%	4.92%	2.51%	0.09%	1.95%	1.67%	0.11%	0.18%	2.46%	0.89%	
MAP@40	0.24%	4.99%	2.55%	0.09%	1.95%	1.67%	0.11%	0.18%	2.52%	0.91%	
MAP@50	0.25%	5.03%	2.58%	0.09%	1.95%	1.67%	0.11%	0.18%	2.55%	0.92%	
MAP@60	0.25%	5.06%	2.60%	0.09%	1.95%	1.67%	0.11%	0.19%	2.58%	0.93%	
MAP@70	0.26%	5.08%	2.62%	0.09%	1.95%	1.67%	0.12%	0.19%	2.60%	0.94%	
MAP@80	0.26%	5.10%	2.63%	0.09%	1.95%	1.67%	0.12%	0.19%	2.61%	0.94%	
MAP@90	0.26%	5.11%	2.64%	0.09%	1.95%	1.67%	0.12%	0.19%	2.63%	0.95%	
MAP@100	0.26%	5.13%	2.65%	0.09%	1.95%	1.67%	0.12%	0.19%	2.64%	0.95%	

ALS: alternating least square.

K-nn: k nearest neighbour

FP: Frequent Pattern Growth

ProductID: trained on Product ID level data

Agg: combinaison @Brand-Gender-Subcategory

Agg Color: combinaison @Brand-Gender-Subcategory-Color

SSENSE