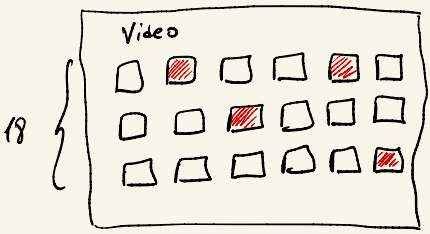


Метрики

Offline

@K
- Precision, Recall, F-мера
- MSE, RMSE
- NDCG
- MAP

Online

- CTR ($\frac{\#clicks}{\#shows}$) $CTR = \frac{4}{18}$
- Time spent
- DAU, MAU
- Retention
- $$
- ?- опрос?

$$RMSE = \sqrt{\sum_{i=1}^{N} (score_i - rating_i)^2}$$

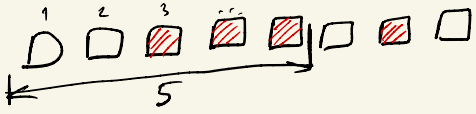
NDCG – Normalized Discounted Cumulative Gain

MAP – Mean Average Precision

$$NDCG@K = \frac{DCG@K}{IDCG@K}$$

user	item	rating
1	1	4
1	2	2
1	3	5
1	4	NaN

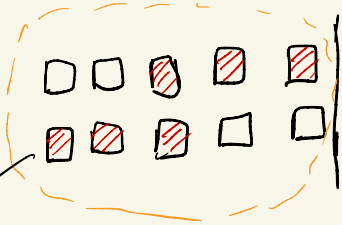
$$CG@K = \sum_{i=1}^{K} G_i$$



$$CG@5 = 0 + 0 + 1 + 1 + 1 = 3$$

$$DCG@K = \sum_{j=1}^{K} \frac{rel_j}{\log_2(j+1)}$$

$$\frac{0}{\log_2(1+1)} + \frac{0}{\log_2(2+1)} + \frac{1}{\log_2(3+1)} + \frac{1}{\log_2(4+1)} + \frac{1}{\log_2(5+1)}$$



– DCG@5

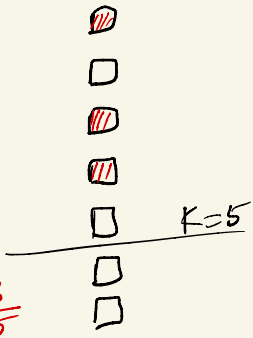
– IDCG@5

$$\frac{1}{\log_2(1+1)} + \frac{1}{\log_2(2+1)} + \frac{1}{\log_2(3+1)} + \frac{0}{\log_2(4+1)} + \frac{0}{\log_2(5+1)}$$

$$MAP@K = \frac{1}{U} \sum_{u=1}^{U} AP@K_u$$

U = #users

$$Precision@K = \frac{\#\text{rel. items at } K}{K}$$

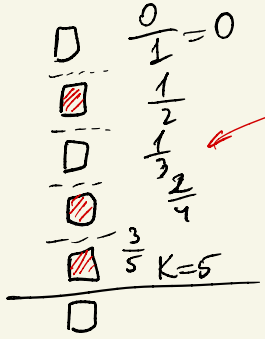


$Precision@5 = \frac{3}{5}$

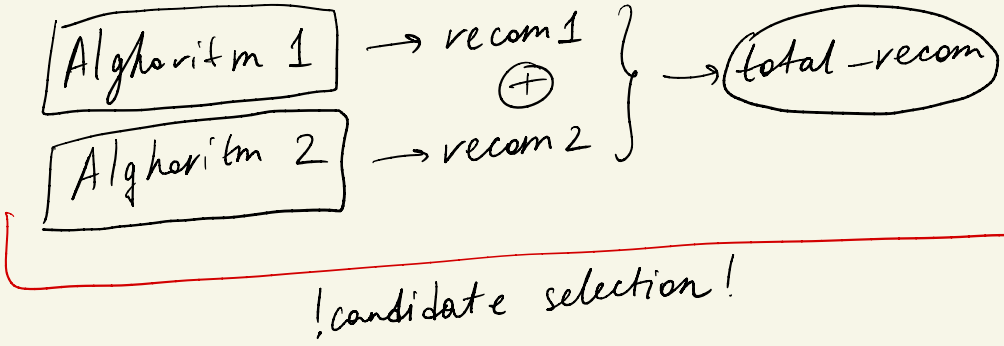
$$AP@K = \frac{1}{N} \sum_{i=1}^{K} Precision(i) \cdot rel(i)$$

N = #rel. items for user

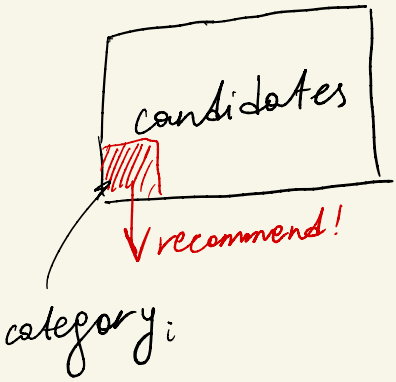
$$rel(k) = \begin{cases} 1, & \text{if item at } k^{th} \text{ position is rel.} \\ 0, & \text{otherwise} \end{cases}$$

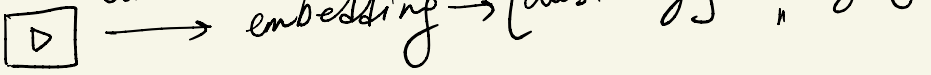


$$AP@5 = \frac{1}{3}\left(0 \cdot 0 + \frac{1}{2} \cdot 1 + \frac{1}{3} \cdot 0 + \frac{2}{4} \cdot 1 + \frac{3}{5} \cdot 1\right)$$



1. Cold start
2. Feedback loop



Recommendations:

1. New
2. Collapse categories
3. Popular
4. Categories sampling
5. No categories :(⟼ !Clustering!