LRMF (ALS) EXPLAINED – SIMPLE 2

K factors

User Factors	Factor 1	Factor 2
User 1	1.4	0.9
User 2	1.2	1
User 3	1.5	0.9
User 4	1.2	0.8

User

×

Product

Kfactors

Product Factors	A	B	C	D
Factor 1	1.4	1.3	0.9	1.2
Factor 2	0.8	1.1	2	0.8

=
Predict

Recomposed Matrix	A	B	C	D
User 1	2.68	2.81	3.06	2.40
User 2	2.48	2.66	3.08	2.24
User 3	2.82	2.94	3.15	2.52
User 4	2.32	2.44	2.68	2.08

Research Paper: Y. Hu, Y.Koren, and C.Volinsky. Collaborative Filtering for Implicit Feedback Datasets in IEEE International Conference on Data Mining (ICDM 2008), pages 263-272, 2008

LRMF (ALS) EXPLAINED - ADVANCED 1

Setting

`u` – user, `v` another user

`i` – item, `j` another item

r_{ui} – observations, e.g. hits, time spent, $r_{ui} = 0$ means missing observation

Preference:

$$P_{ui} = \begin{cases} 1, & r_{ui} > 0 \\ 0, & r_{ui} = 0 \end{cases}$$

Confidence:

$$C_{ui} = \begin{cases} 1 + \alpha \times r_{ui}, & r_{ui} > 0 \\ 1, & r_{ui} = 0 \end{cases}$$

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