Personal Recommendation Algorithm

Main Flow

- 个性化召回算法LFM(latent factor model)综述
- LFM理论知识与公式推导
- LFM算法与CF算法的优缺点比较

个性化召回算法LFM综述

- LFM算法的背景
- 什么是LFM算法
- LFM算法的应用场景

LFM算法举例

	Item1	Item2	Item3
User1	1	0	1
User2	0	1	0
User3	1	1	0

User1:[0.325,0.456....0.768]

Item1:[0.215,0.569....0.368]

LFM应用场景举例

- 计算用户toplike
- 计算item的topsim
- 计算item的topic

Class two

Personal Recommendation Algorithm

LFM理论知识

- LFM建模公式

$$p(u,i) = p_u^T q_i = \sum_{f=1}^{F} p_{uf} q_{if}$$

LFM理论知识

- LFM loss function

$$loss = \sum_{(u,i)\in D} (p(u,i) - p^{LFM}(u,i))^2$$

$$loss = \sum_{(u,i)\in D} (p(u,i) - \sum_{f=1}^{F} p_{uf} q_{if})^2 + \lambda \left| p_u \right|^2 + \lambda \left| q_i \right|^2$$

LFM理论知识

- LFM算法迭代

$$loss = \sum_{(u,i)\in D} \left(p(u,i) - \sum_{f=1}^{F} p_{uf} q_{if}\right)^2 + \lambda \left|p_u\right|^2 + \lambda \left|q_i\right|^2$$

$$\frac{\partial loss}{\partial p_{uf}} = -2(p(u,i) - p^{LFM}(u,i))q_{if} + 2\lambda p_{uf} \qquad p_{uf} = p_{uf} - \beta \frac{\partial loss}{\partial p_{uf}}$$

$$\frac{\partial loss}{\partial q_{if}} = -2(p(u,i) - p^{LFM}(u,i))p_{uf} + 2\lambda q_{if} \qquad q_{if} = q_{if} - \beta \frac{\partial loss}{\partial q_{if}}$$

LFM理论知识

- 负样本选取
- 隐特征F,正则参数,learning rate

LFMvsCF

- 理论基础
- 离线计算空间时间复杂度
- 在线推荐与推荐解释