Common Notation

RECOMMENDER SYSTEMS COURSERA SPECIALIZATION

Basic Objects

We need a way to talk about users, items, and the ratings matrix

I	The set of items.
U	The set of users.
R	The ratings matrix or set of ratings.
$u, v \in U$	An individual user.
$i, j \in I$	Individual items.
$r_{ui} \in R$	A rating given by user u for item i.
$R_u \subset R$	The set of ratings given by user u.
$R_i \subset R$	The set of ratings given for item i.
$\vec{r}_u$ or $\mathbf{r}_u$	The ratings given by user u, as a vector with missing values for unrated items. We will often work with a normalized vector $\hat{\mathbf{r}}_u$.
$\vec{r}_i$ or $\mathbf{r}_i$	The ratings given for item i, as a vector with missing values for unrated items.

Scoring and Ordering

$s(i; u)$	The score for item i for user u.
$s(i; u, q, x)$	The score for item i for user u with query q in context x.
$O(I; u, q, x)$	The ordering of items I for user u with query q in context x.

Matrix Factorization

$R = P\Sigma Q^{\mathrm{T}}$	A factorization of the ratings matrix R into a $\lvert U\rvert \times k$ user-feature preference matrix P and a $\lvert I\rvert \times k$ item-feature relevance matrix Q.
$\vec{p}_u$ or $\mathbf{p}_u$	The user feature vector over latent features.
$\vec{q}_i$ or $\mathbf{q}_i$	The item feature vector.