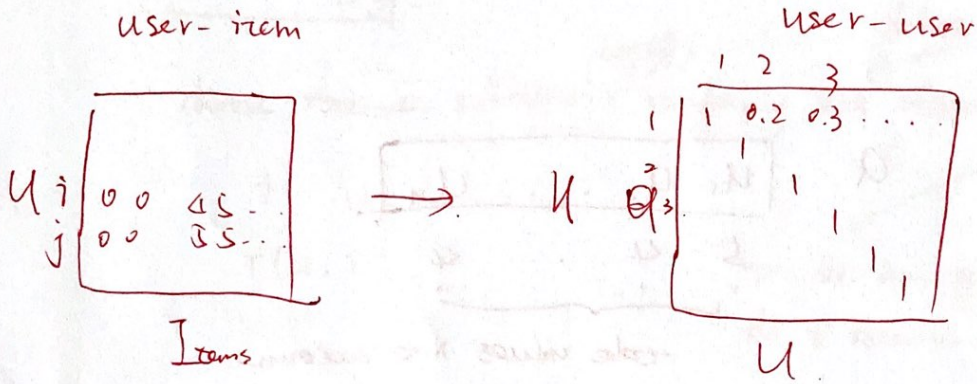
Collaborative Filtering

take account of people recomandation. "mouth of words"

$$\frac{n^2 - n}{2} = \frac{n(n-1)}{2}$$

3 step

1. : can be done offline. (i.e. once then run it periodically)



tell us how similary each user with each other.

Pearson Correlation.

$$w_{a,u} = \frac{\sum (\text{consider all items}}{\sqrt{\quad} \times \sqrt{\quad}}$$

normalising by the num of the

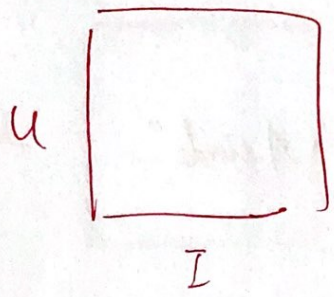
U_1 4 2 4 $\frac{10}{3}$ (if the user's interest is below or above the average)

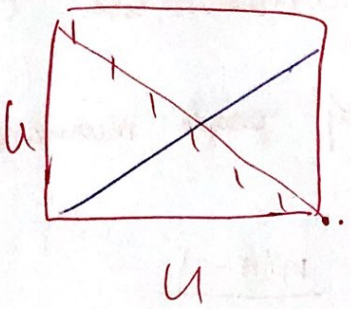
U_2 3 1 5 $\frac{11}{3}$

\+ × + ↑
− × − ↑
\+ × − ↓

⇒ only when two users disagree on average score, we get negative score

$[R-1]$.



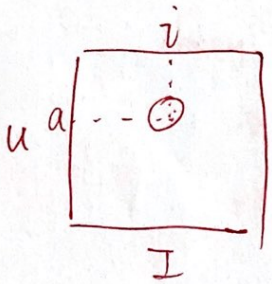


(neighbours)

how to we choose users to make recommandations?

1. threshold;

2. ...



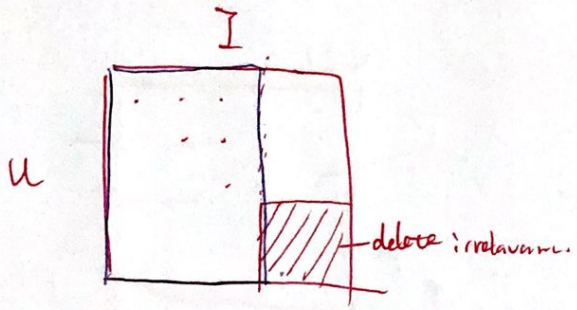
a $\boxed{u_1\ u_2\ \dots\ u_n}$

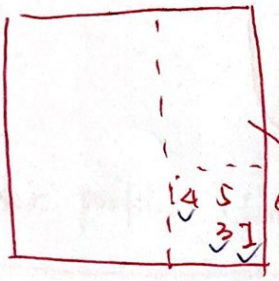
5 4 ... 4

take values into account and make recommandation.

$r_{u,i} - \bar{r}_u$ w_{au}.

how far the ranking with average score.





randomly picking rows and columns.

delete ie then predict the rank number

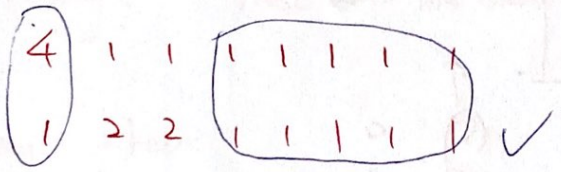
choose ~~rows a~~ submatrix randomly (eg 1/3) and repeat ie compare with ~~the one~~

i u

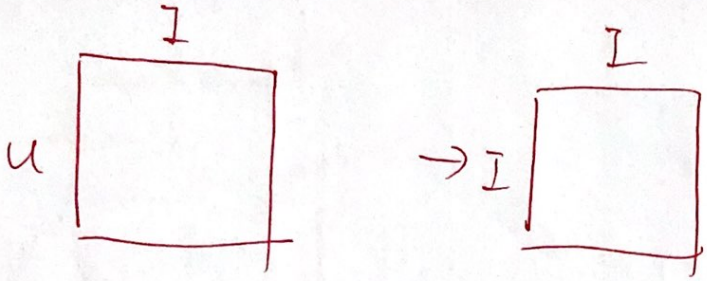
r(u, i)

to see how good we could predict the recommendation.

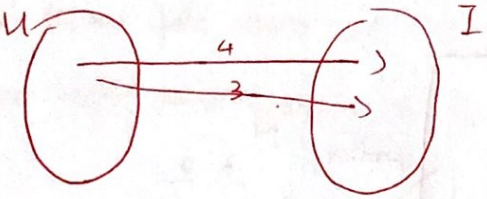
MAE:



IR-3.

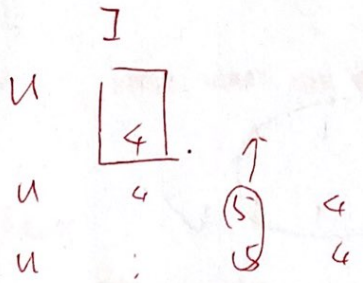


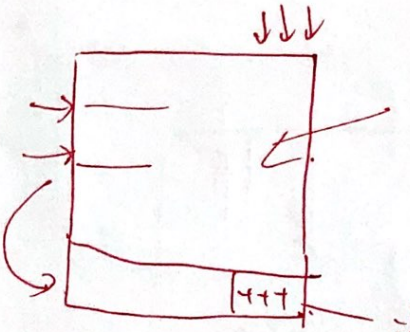
Graph decomposition



Clustering users and items and .
(pseudo users see and pseudo items see) ..

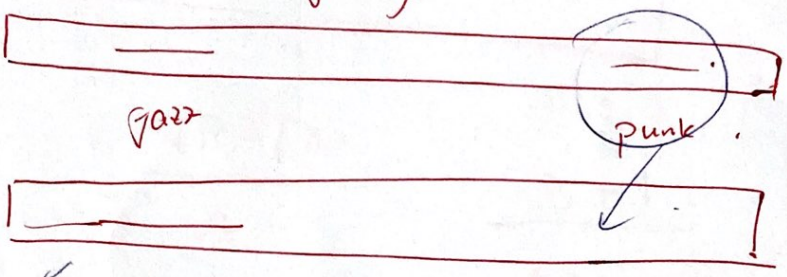
honest, reliable? ~~To~~ am if the producer of that item.





if add 10, 20 fake users at the bottom.
they give high positive rating of the last 3 items

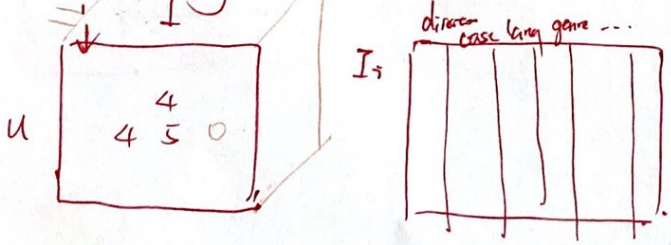
User profile. (long array)



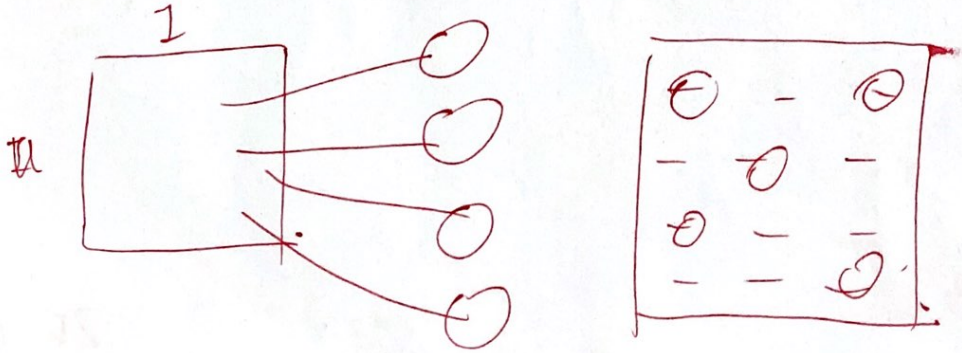
visualize the neighborhood.

gather ratings: most users are slow to give feedback.

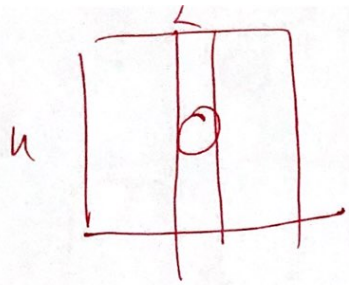
Collaborating filter



(not only the user is rating the movie, they are rating the features)



IR-5


u