Swing

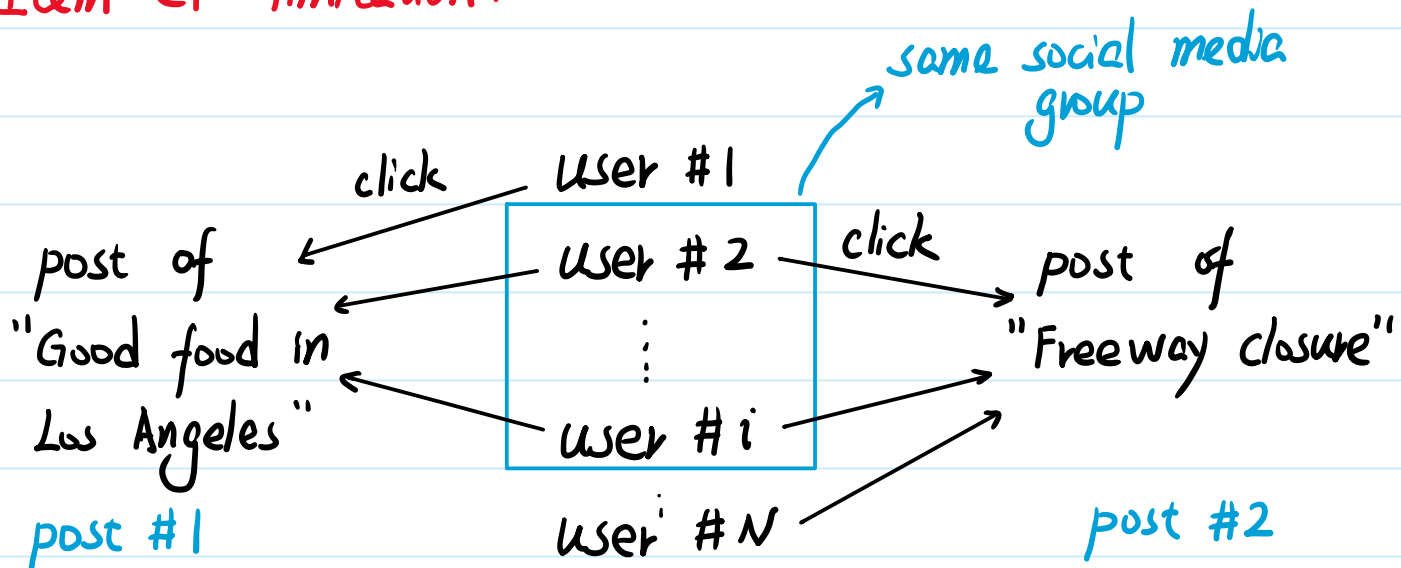**Another way for candidate retrieval: swing**

Swing is similar to item CF;
Difference: how similarity is calculated

Item CF limitation:

same social media group

click — User #1

User #2 — click

post of "Good food in Los Angeles"

User #i

post of "Freeway closure"

post #1

User #N

post #2

$$\text{similarity}(\text{post \#1}, \text{post \#2}) = \frac{(i-1)}{\sqrt{i-1} \cdot \sqrt{N-1}}$$

the system feels posts #1 and #2 are similar
However, they are NOT similar!
(users belong to the same social media group clicked both posts)

Swing

How to address the limitations of item CF? Swing.

① the set of objects liked by user u_1 is J_1

② the set of objects liked by user u_2 is J_2

③ overlap $(u_1, u_2) = |J_1 \cap J_2|$

④ larger overlap value $\rightarrow$ larger chance that u_1 and u_2 come from same social media group.

⑤ reduce the weight for u_1 and u_2 when calculating similarity

Swing model :

① W_1 : users who like item i_1

② W_2 : users who like item i_2 penalize if u_1, u_2 from same group

③ $V = W_1 \cap W_2$: users who like both i_1 and i_2

④ $\text{similarity}(i_1, i_2) = \sum\limits_{u_1 \in V} \sum\limits_{u_2 \in V} \dfrac{1}{\alpha + \text{overlap}(u_1, u_2)}$

$\alpha \rightarrow$ hyper parameter