



On the Optimal Setting of Spreading Activation Parameters to Calculate Recommendations on the Knowledge Graph

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AGENDA

Introduction

Information Representation

Recommendation Technique

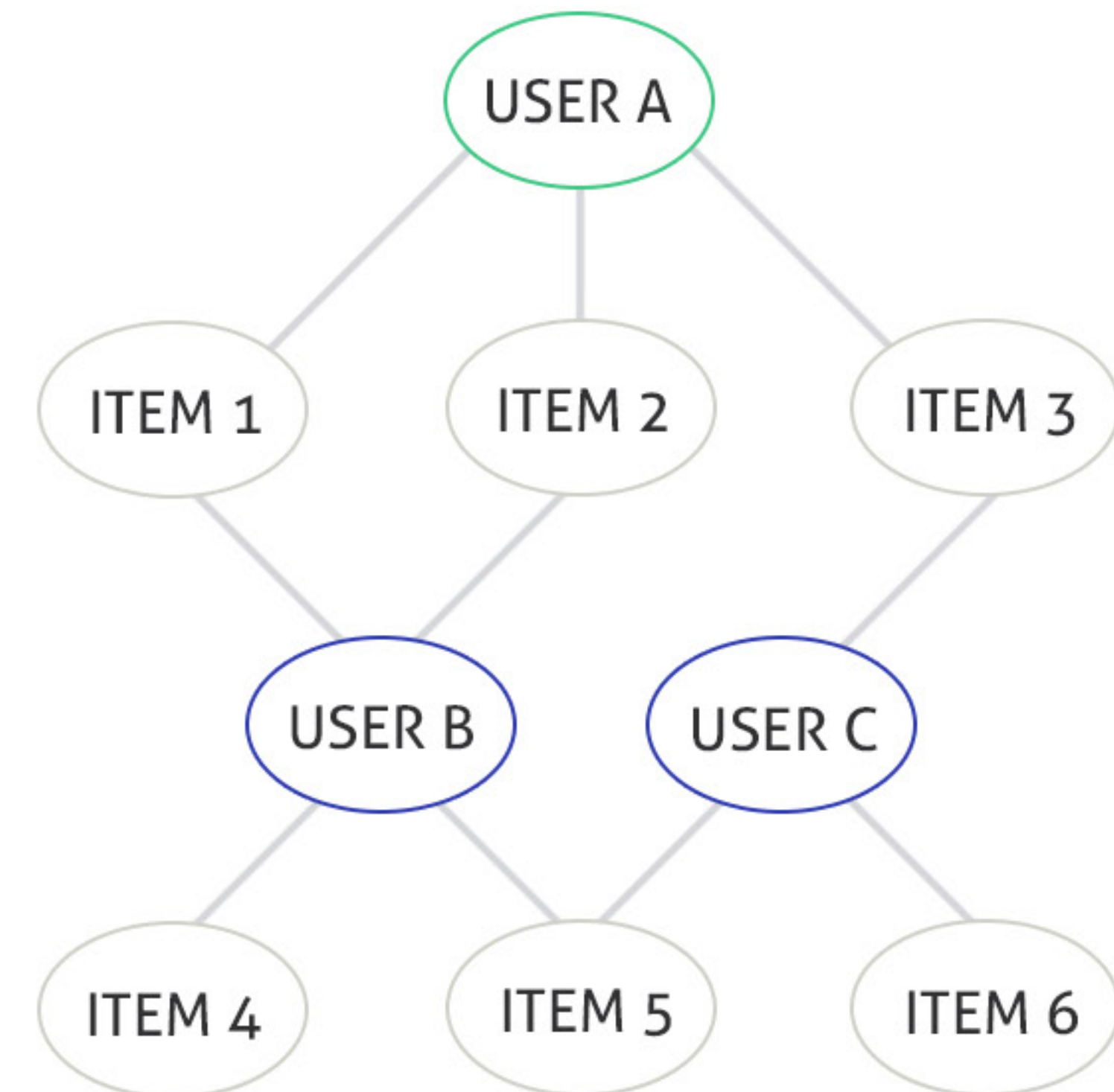
Evaluation

Conclusion

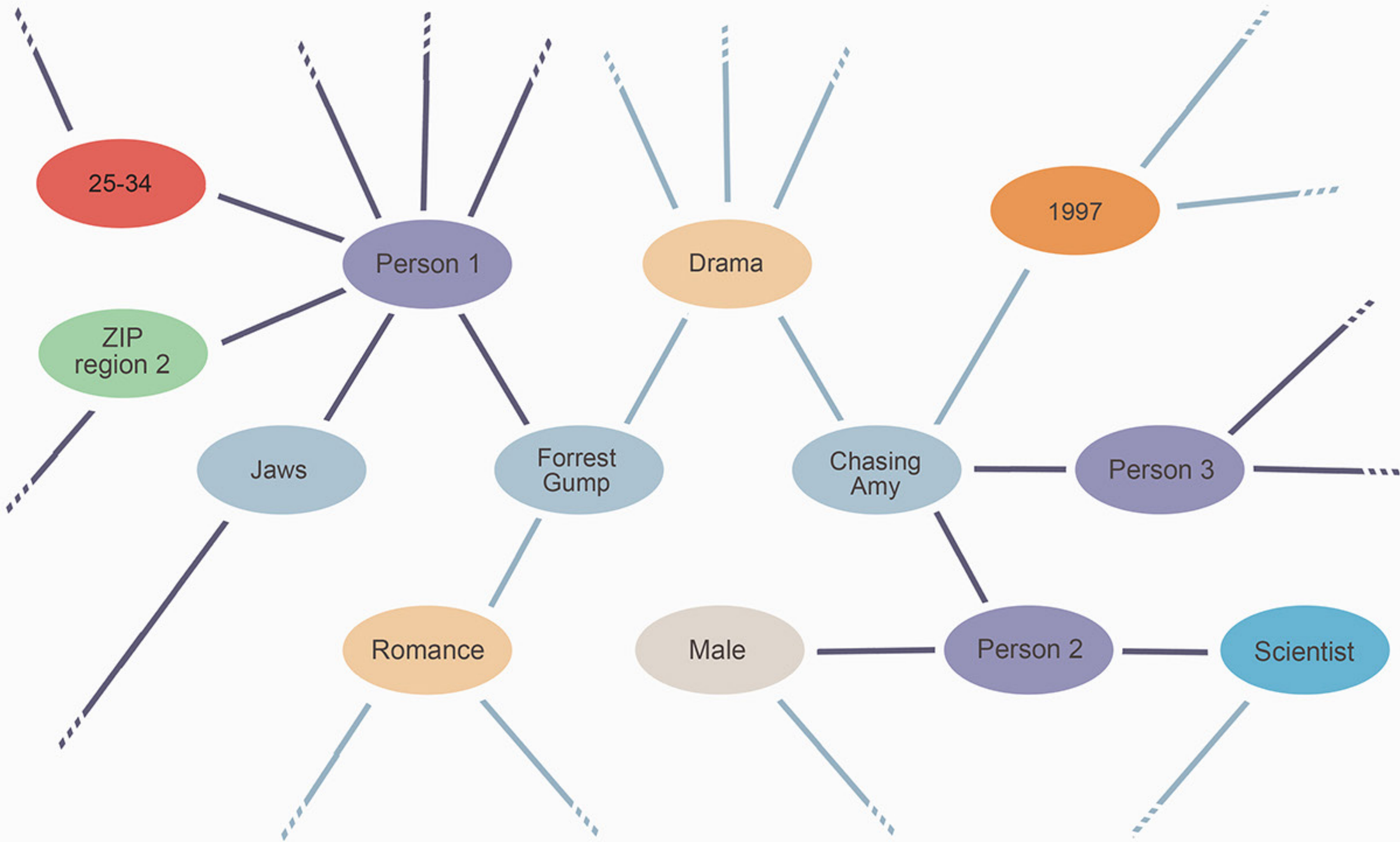


MATRIX VS GRAPH

	ITEM 1	ITEM 2	ITEM 3	ITEM 4	ITEM 5
USER 1	3				
USER 2	4	5	3		?
USER 3		3		2	
USER 4			2	3	4

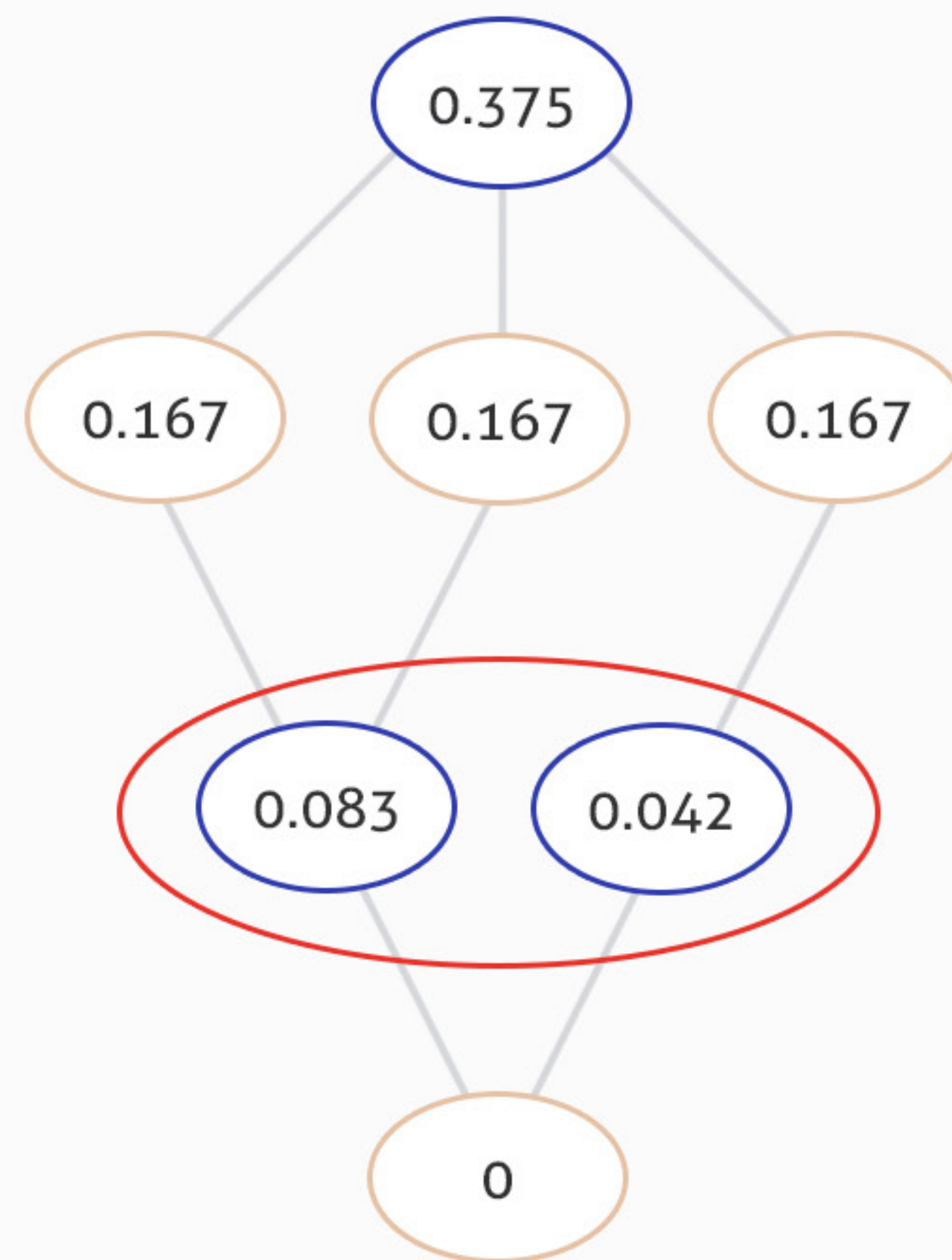
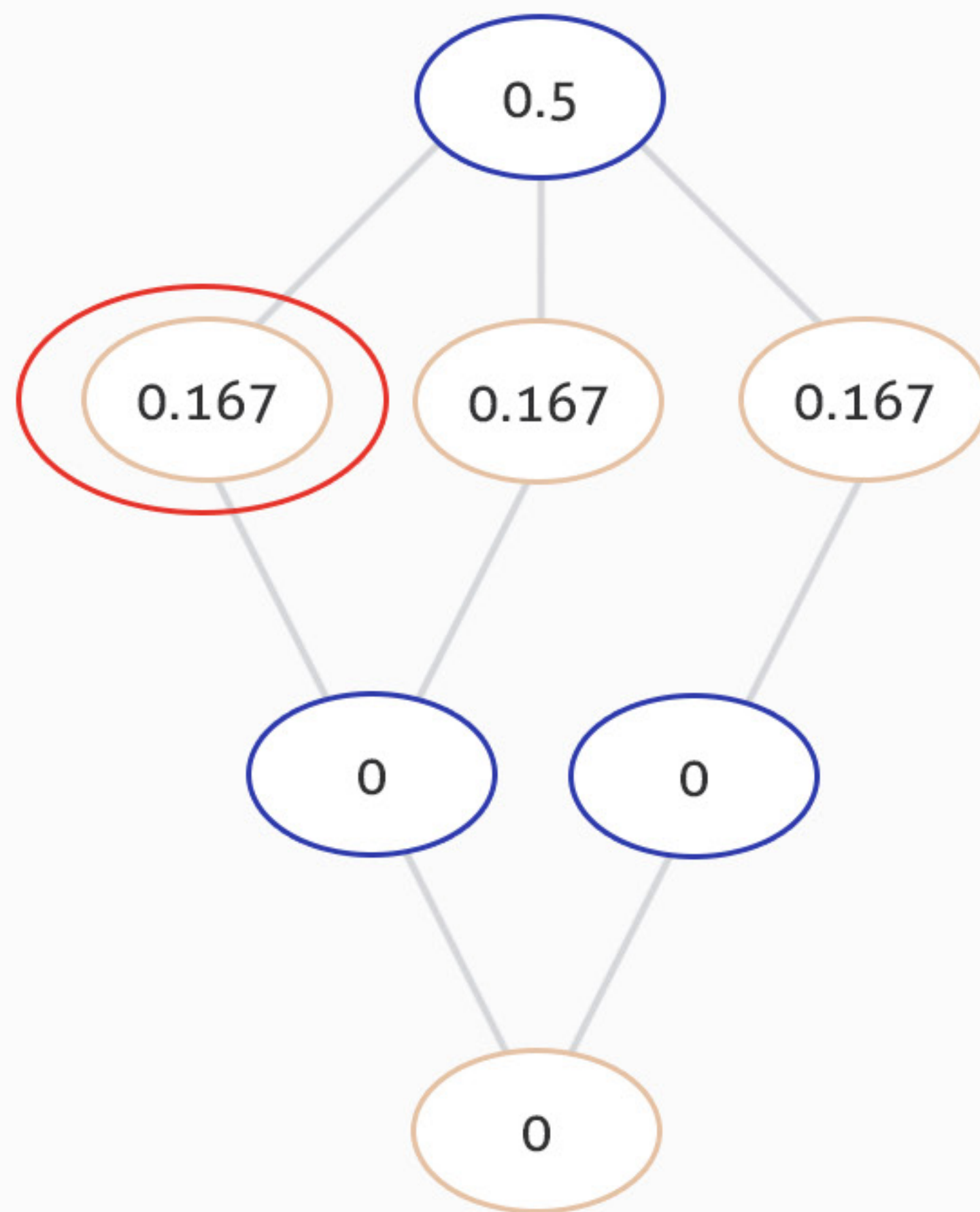
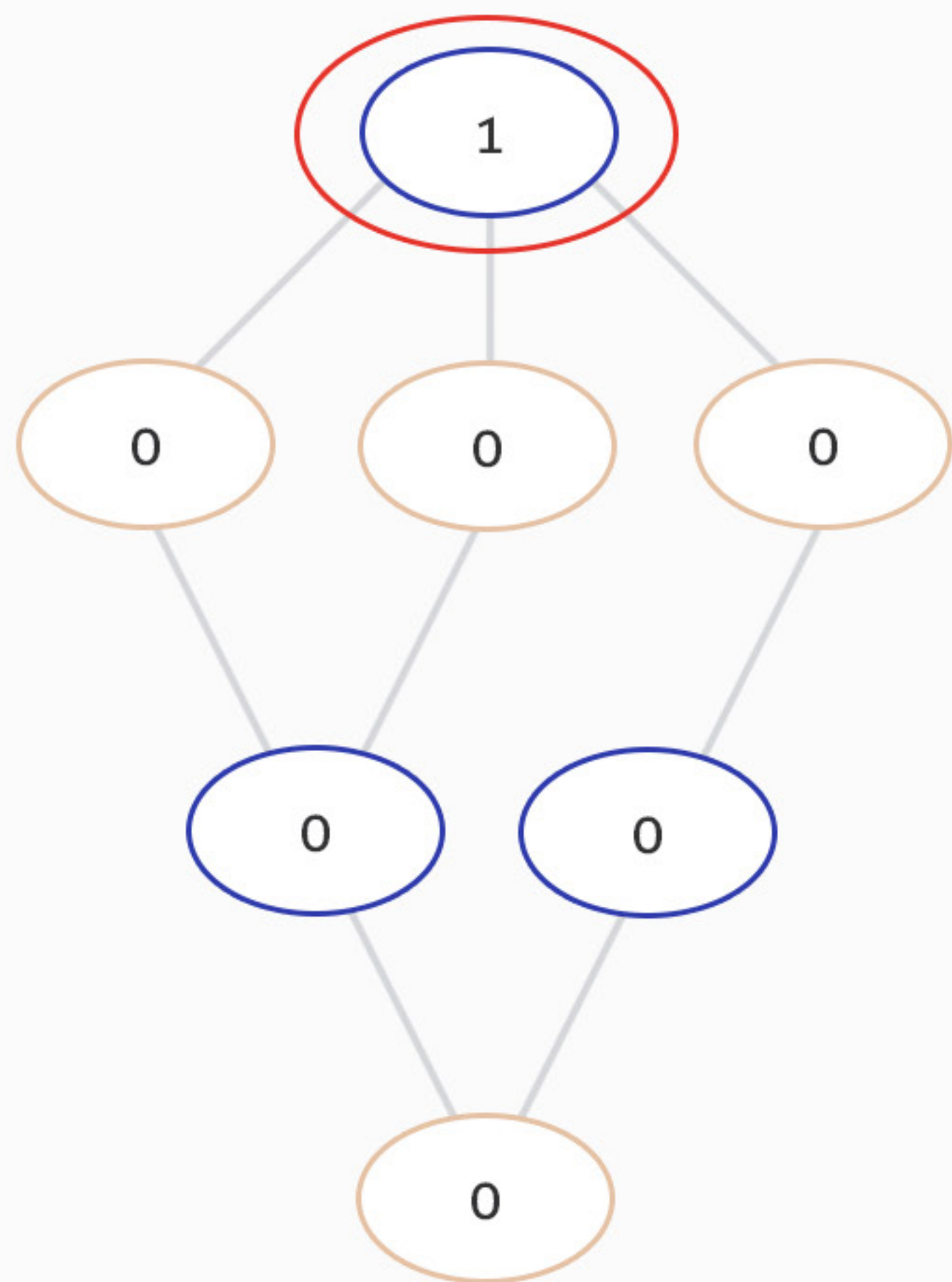


REPRESENTATION





SPREADING ACTIVATION



FORMULA, SPREADING ACTIVATION

$$a_{(i+1)}(n) = r_a a_{(i)}(n) + r_s \sum_{m \in M_n} \frac{a_{(i)}(m)}{|M_n|}$$



THE MOVIELENS DATASET

COUNT OF NODE TYPES

<i>NODE TYPE</i>	<i>COUNT</i>
Person	6040
AgeCategory	7
Gender	2
Occupation	21
ZipCodeRegion	10
Item	3883
Genre	18
YearOfPublishing	81

COUNT OF RELATION TYPES

<i>EDGE TYPE</i>	<i>COUNT</i>
PersonAgeCategory	6040
PersonGender	6040
PersonOccupation	6040
PersonZipCodeRegion	6040
ItemGenre	6408
ItemYearOfPublishing	3883
ItemRating	1000209

Count of graph entities by type in the MovieLens dataset

EVALUATION TECHNIQUE

Initialize the knowledge graph with the facts.

Iterate through relax parameter settings {

 Conduct 10k times {

 Generate recommendations

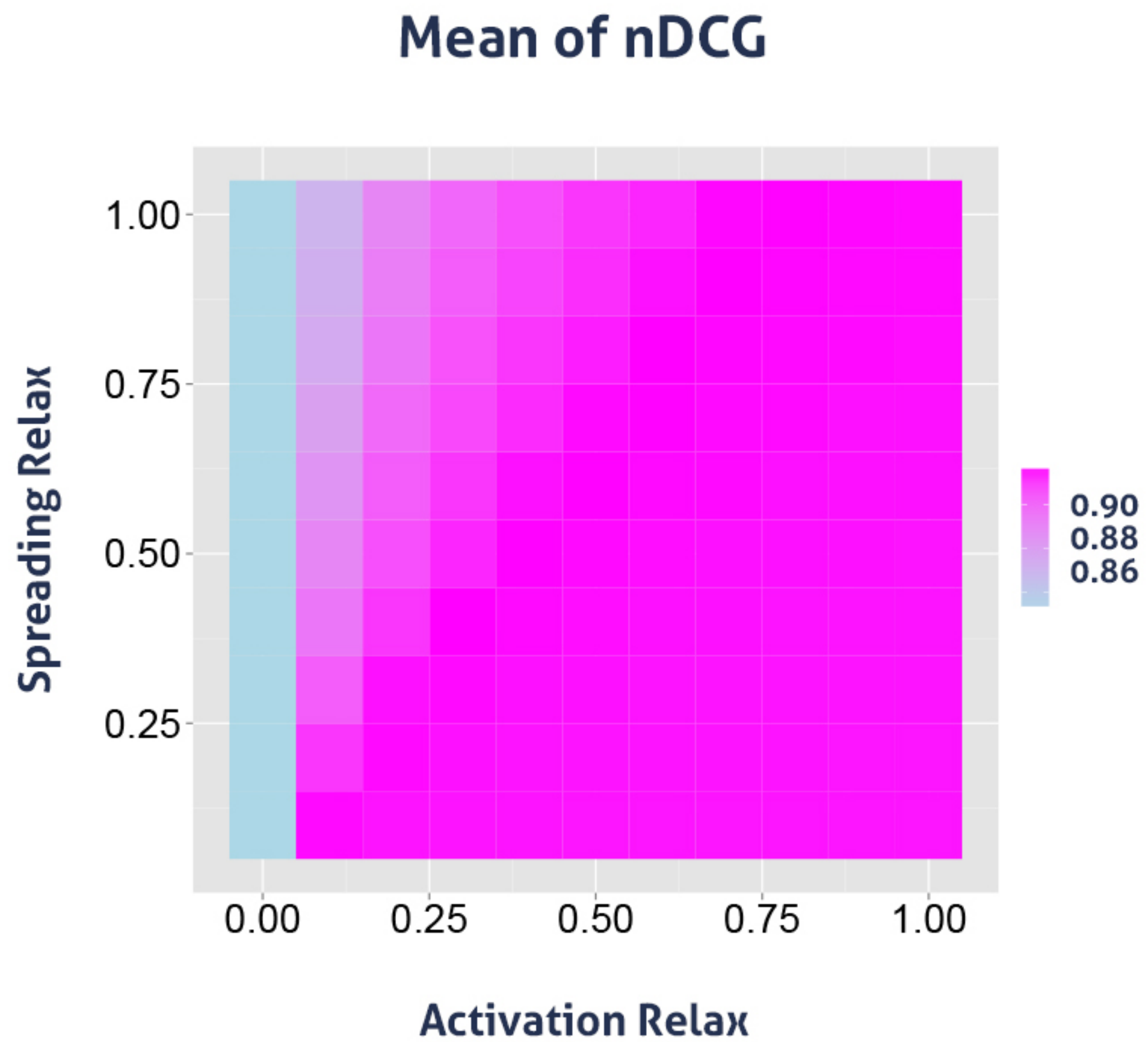
 Record the evaluation measures

 Add the current rating to the graph

 }

}

PERFORMANCE



CONCLUSION

- Spreading activation shows a stable performance regarding the relax parameter settings.
- The structure / topology of the network has a strong influence on the recommended items.
- The involvement of network science stabilizes spreading activation.
- The sum of the relax parameters does not have to sum up to 1.

THANK YOU!



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