

Personalization through Query Explanation and Document Adaptation

presented by

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SCE, NTU, Singapore

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LINA, Universite de Nantes, France

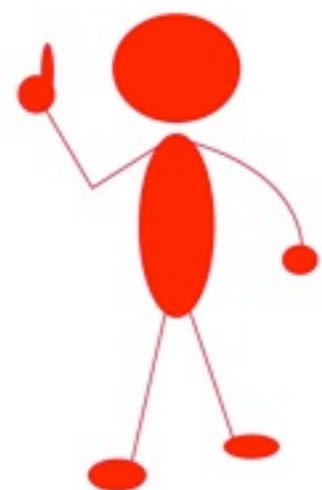
And Gabriella Pasi

DISCo, Universita di Milano Bicocca, Italy

PersDB 2010

September 13, 2010

Personalization?

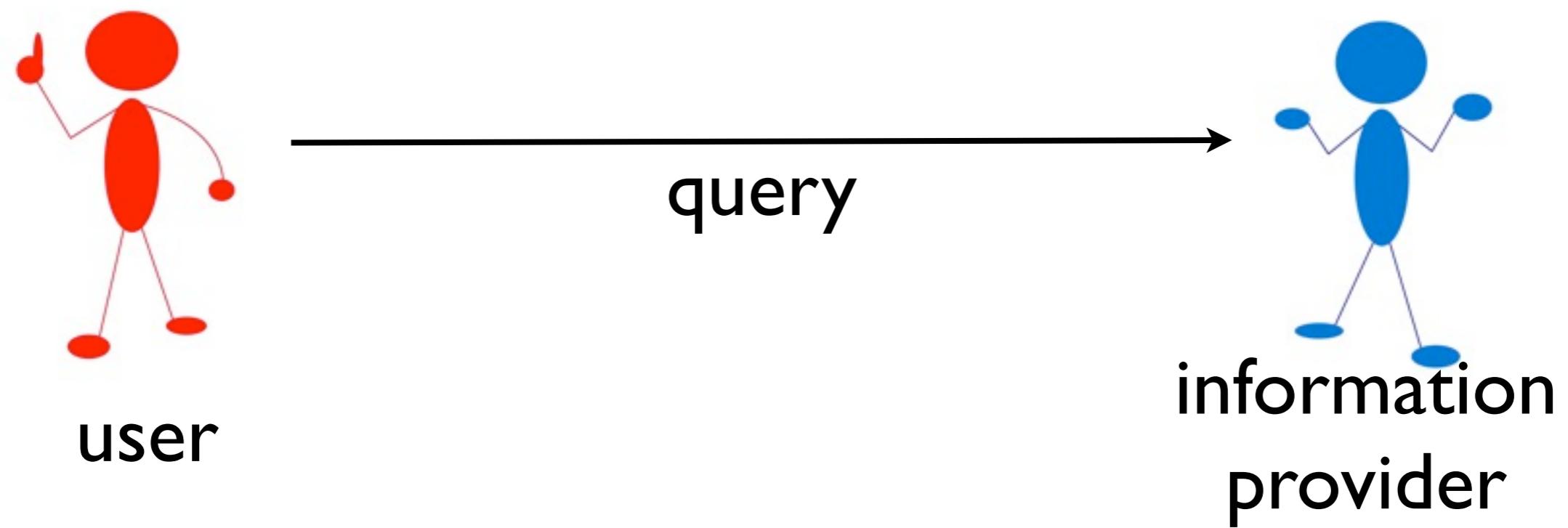


user

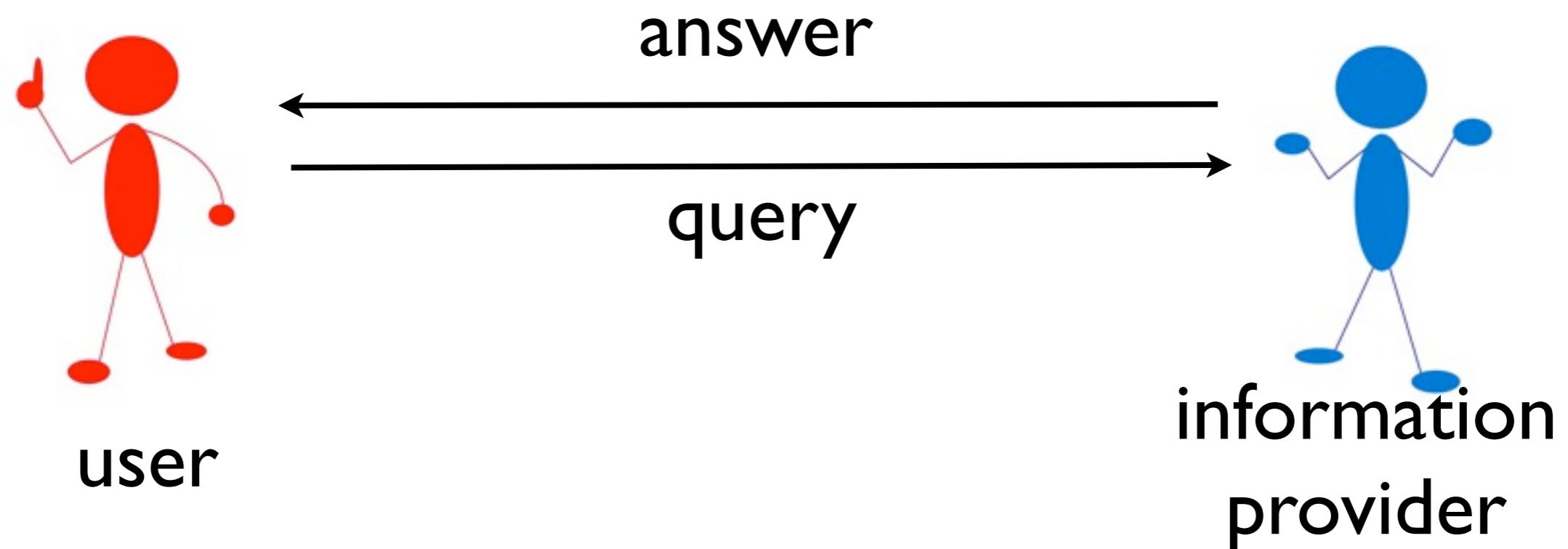


information
provider

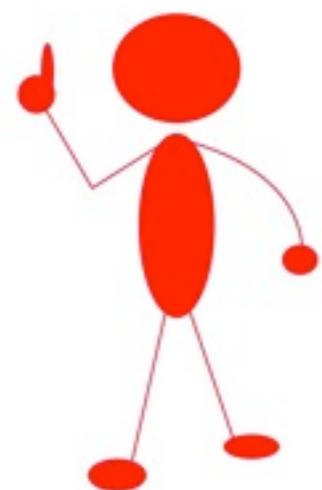
Personalization?



Personalization?



Personalization?

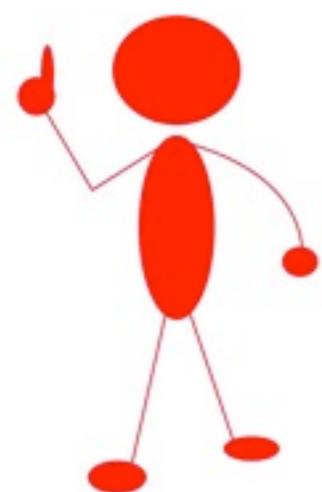
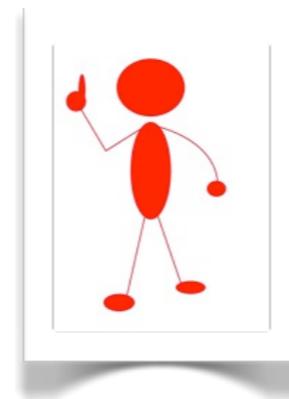


user



information
provider

Personalization?

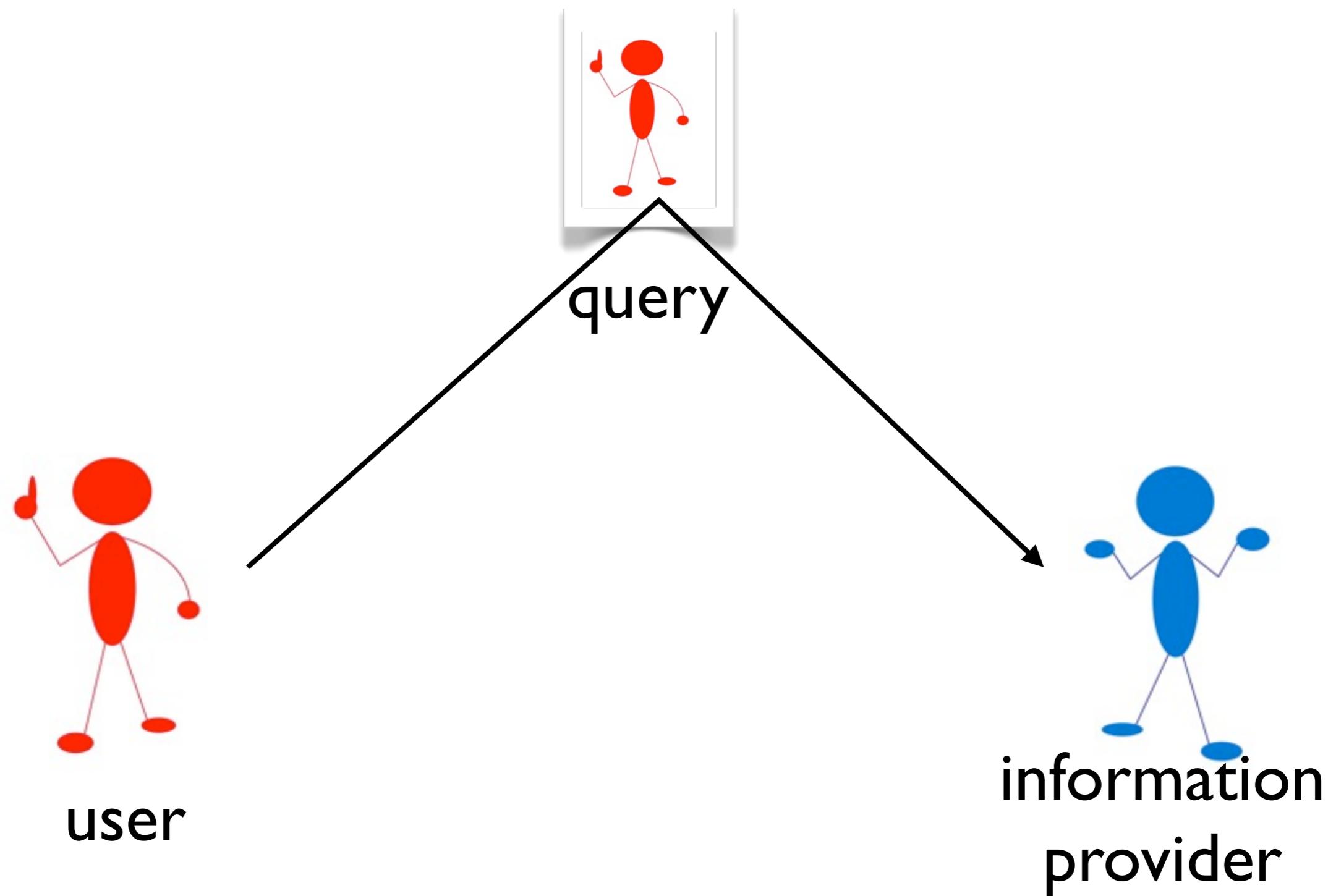


user

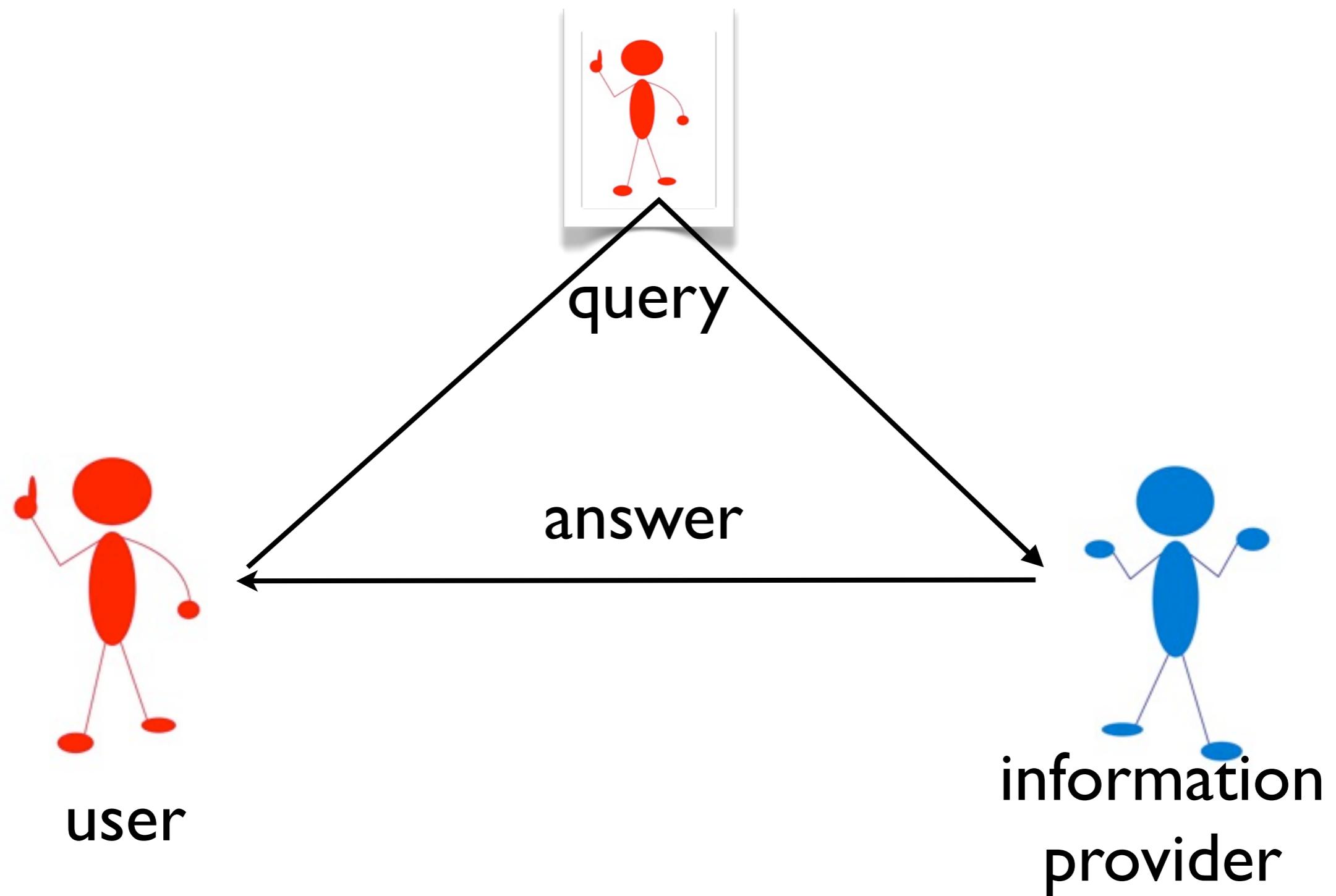


information
provider

Personalization?



Personalization?

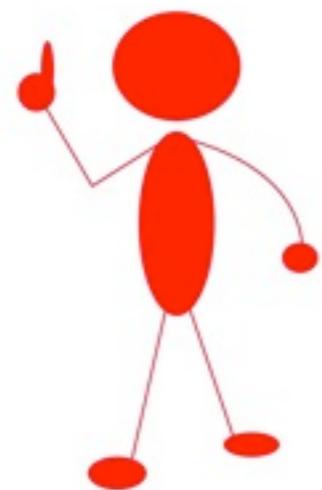


Personalization?

- Implicit or explicit collection of user's behavior → Privacy concerns
- Personalize retrieval process:
 - expanding query → «Noisy» + «unbalance»
 - re-ranking
 - re-indexing → Costly



Our Main Idea

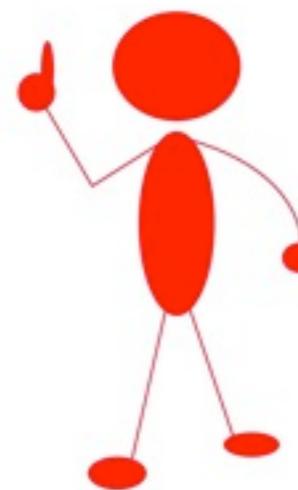


user



information
provider

Our Main Idea



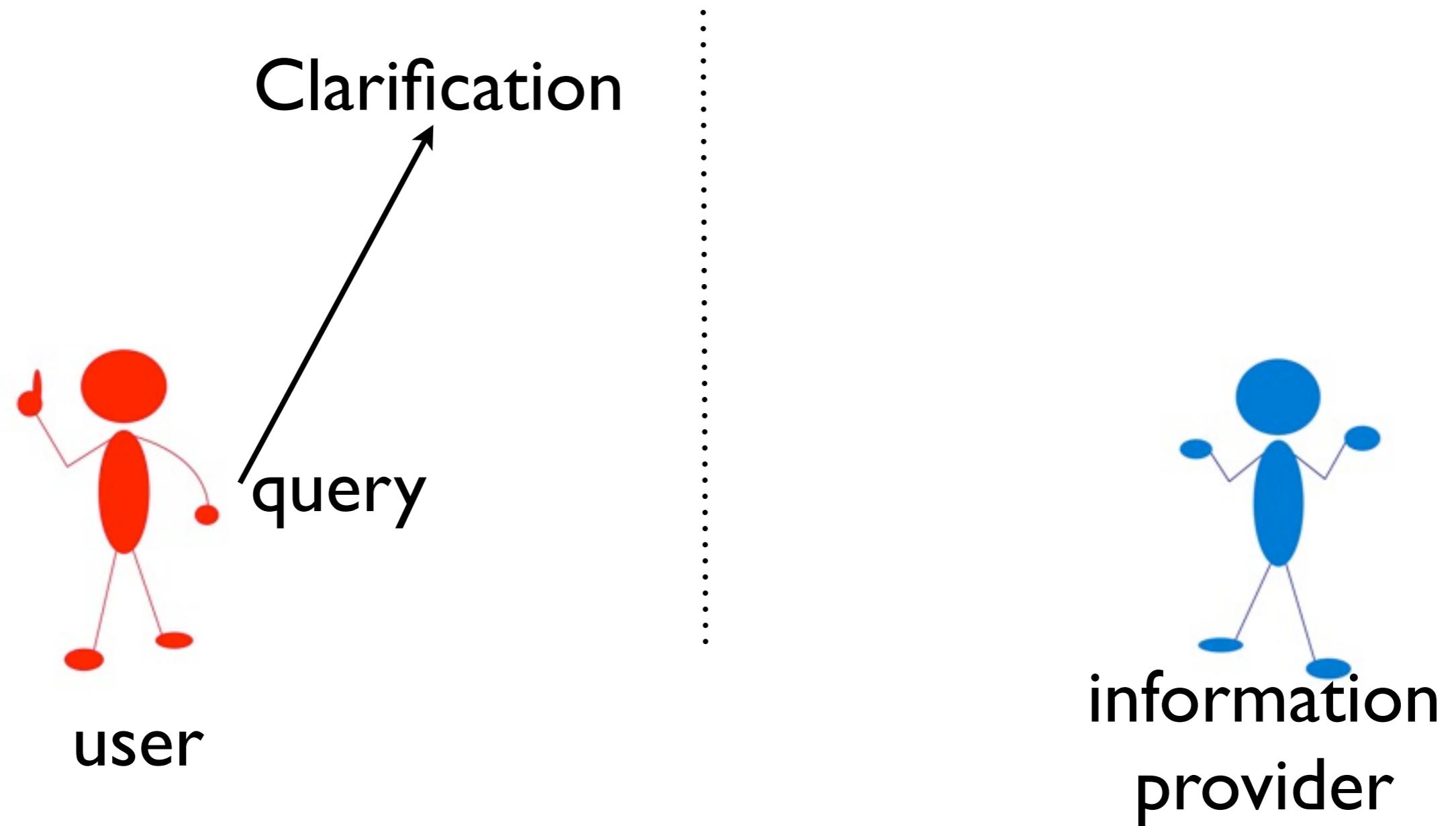
query

user

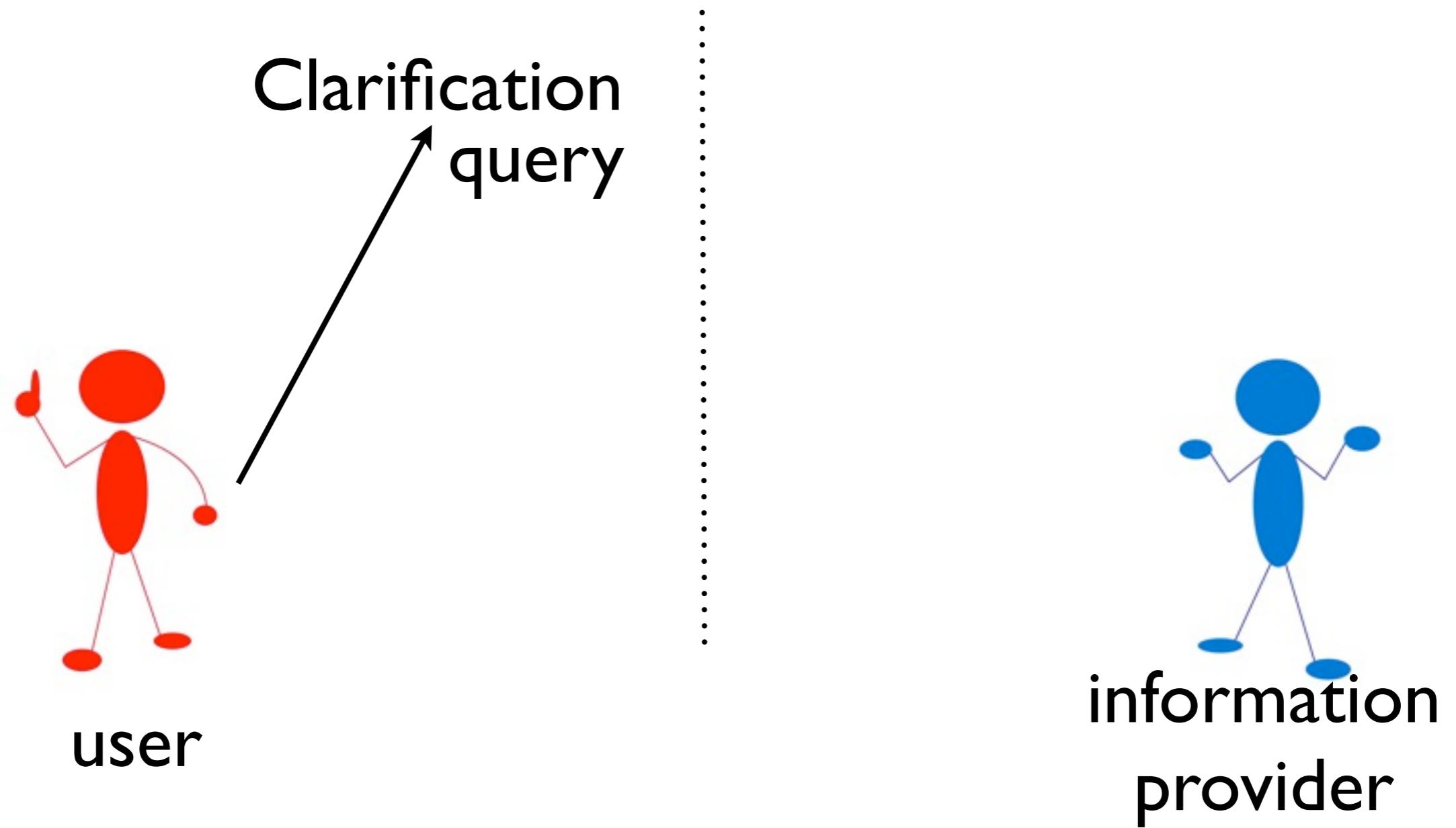


information
provider

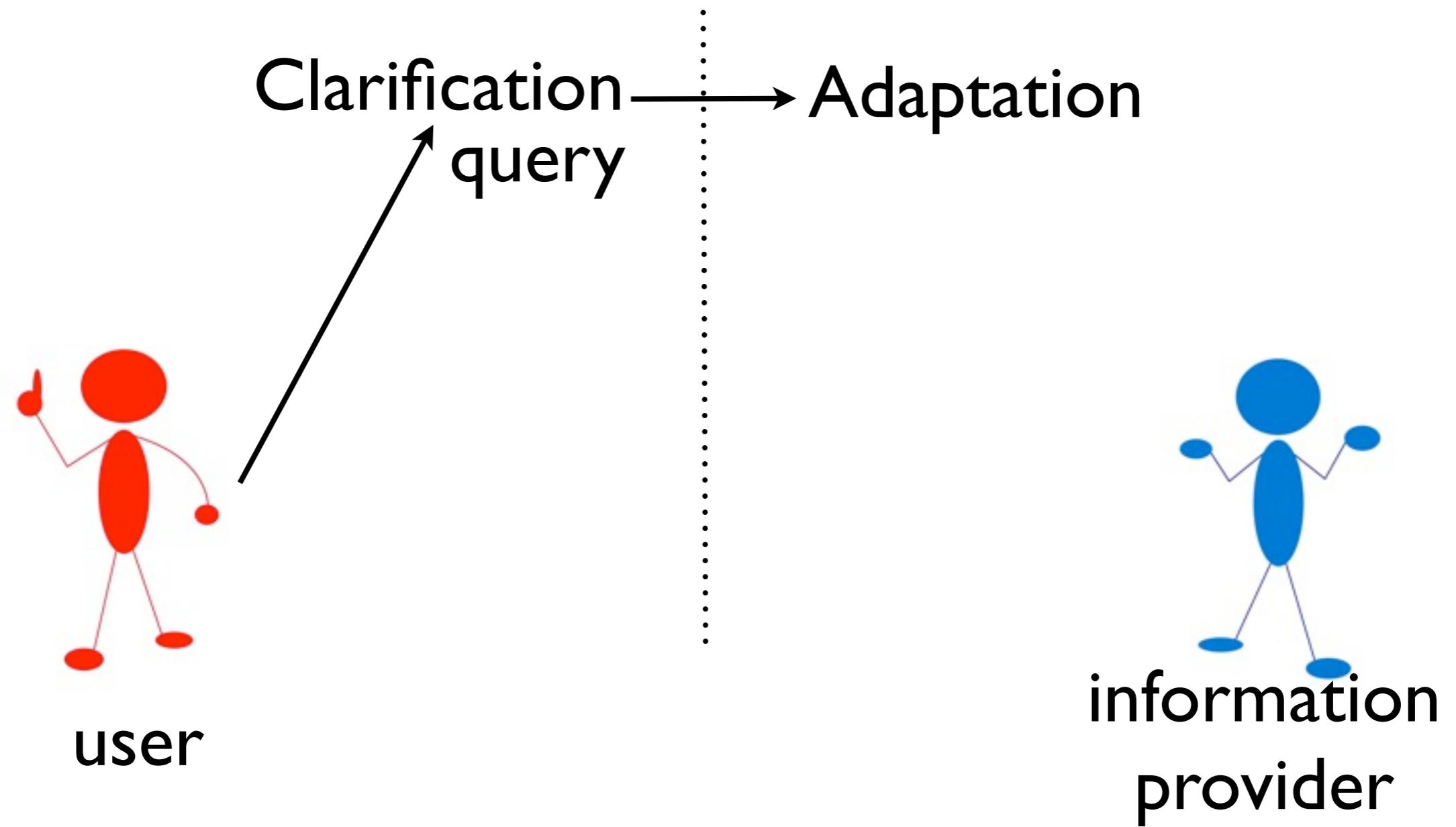
Our Main Idea



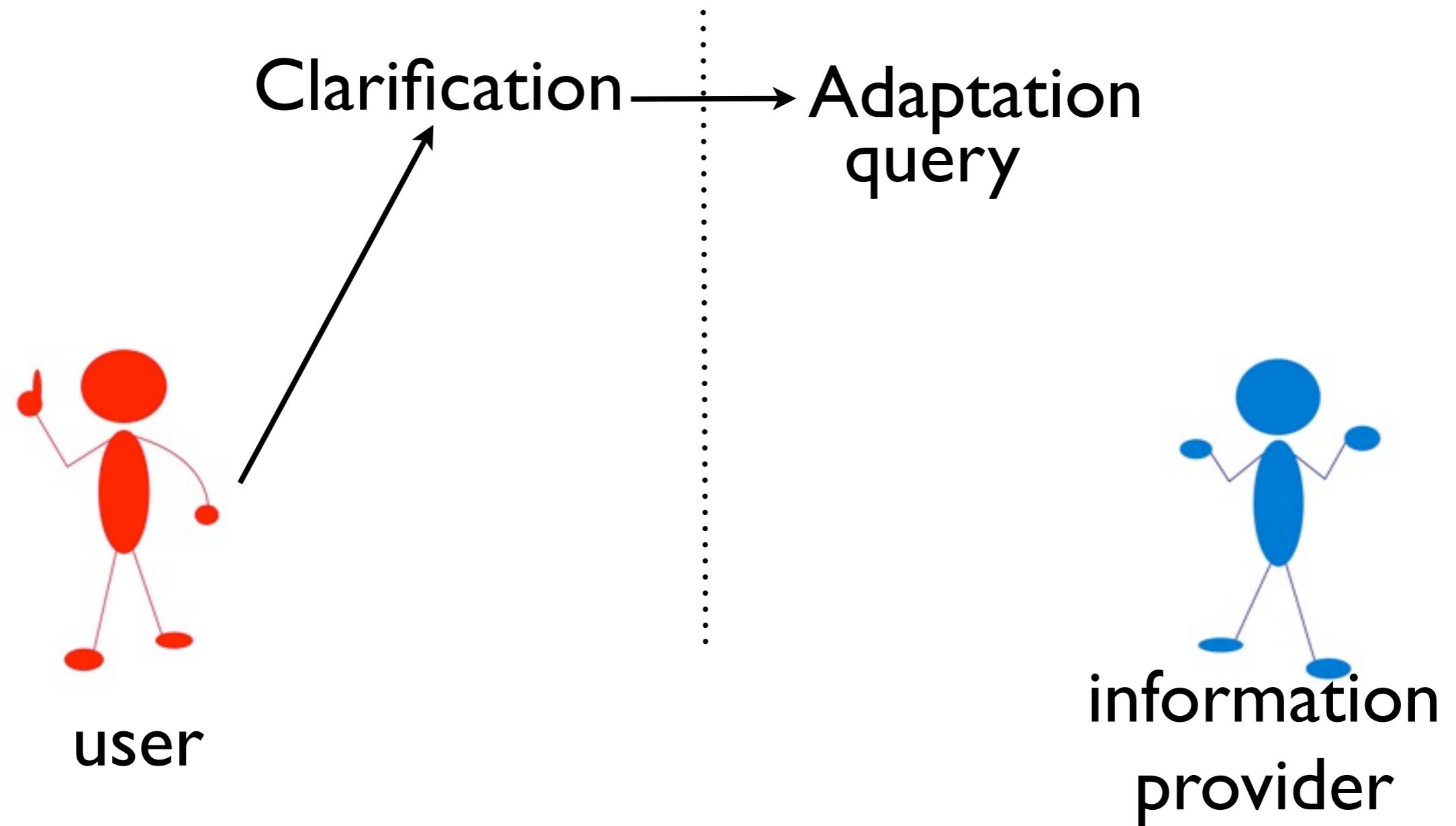
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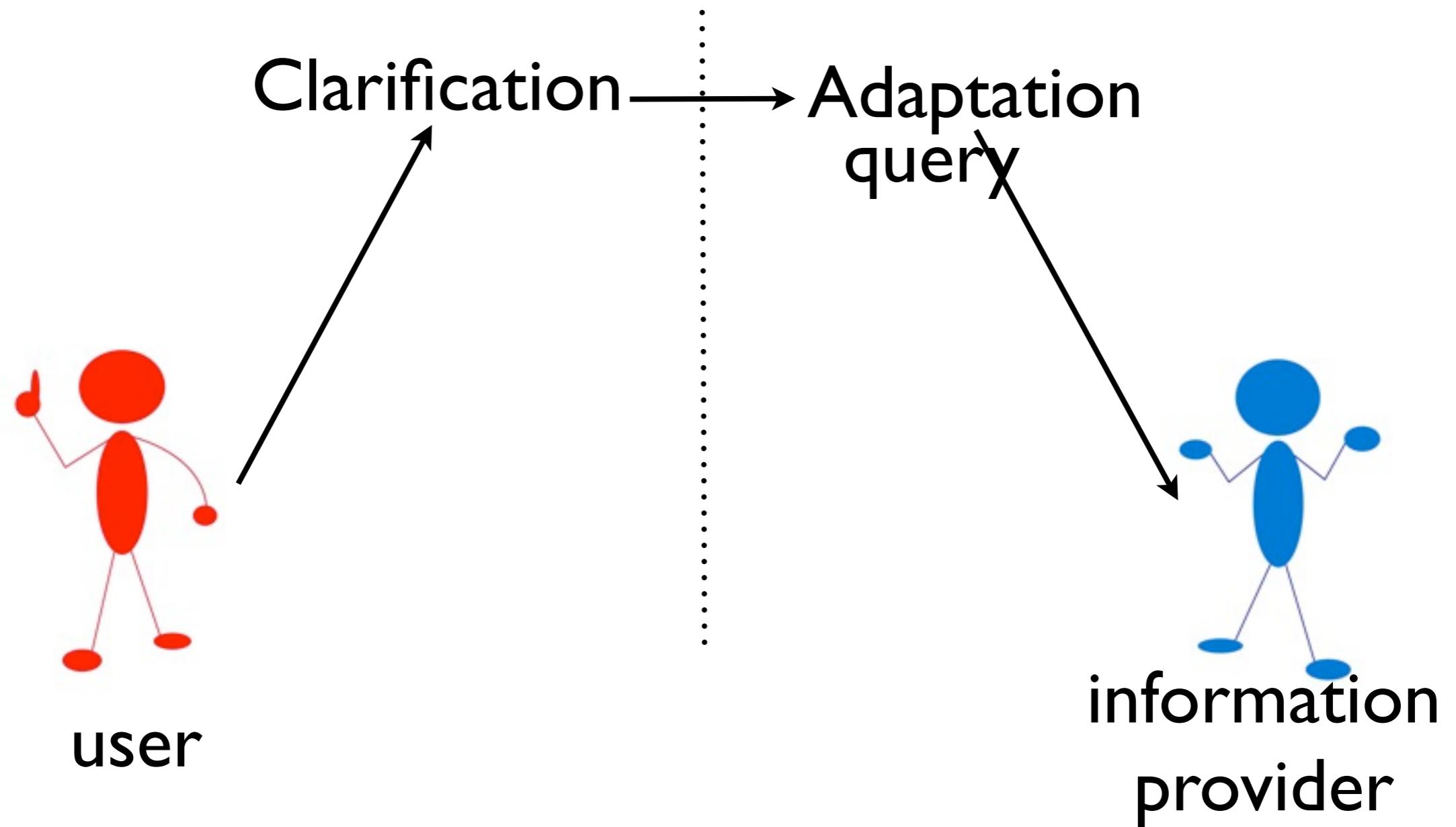
Our Main Idea



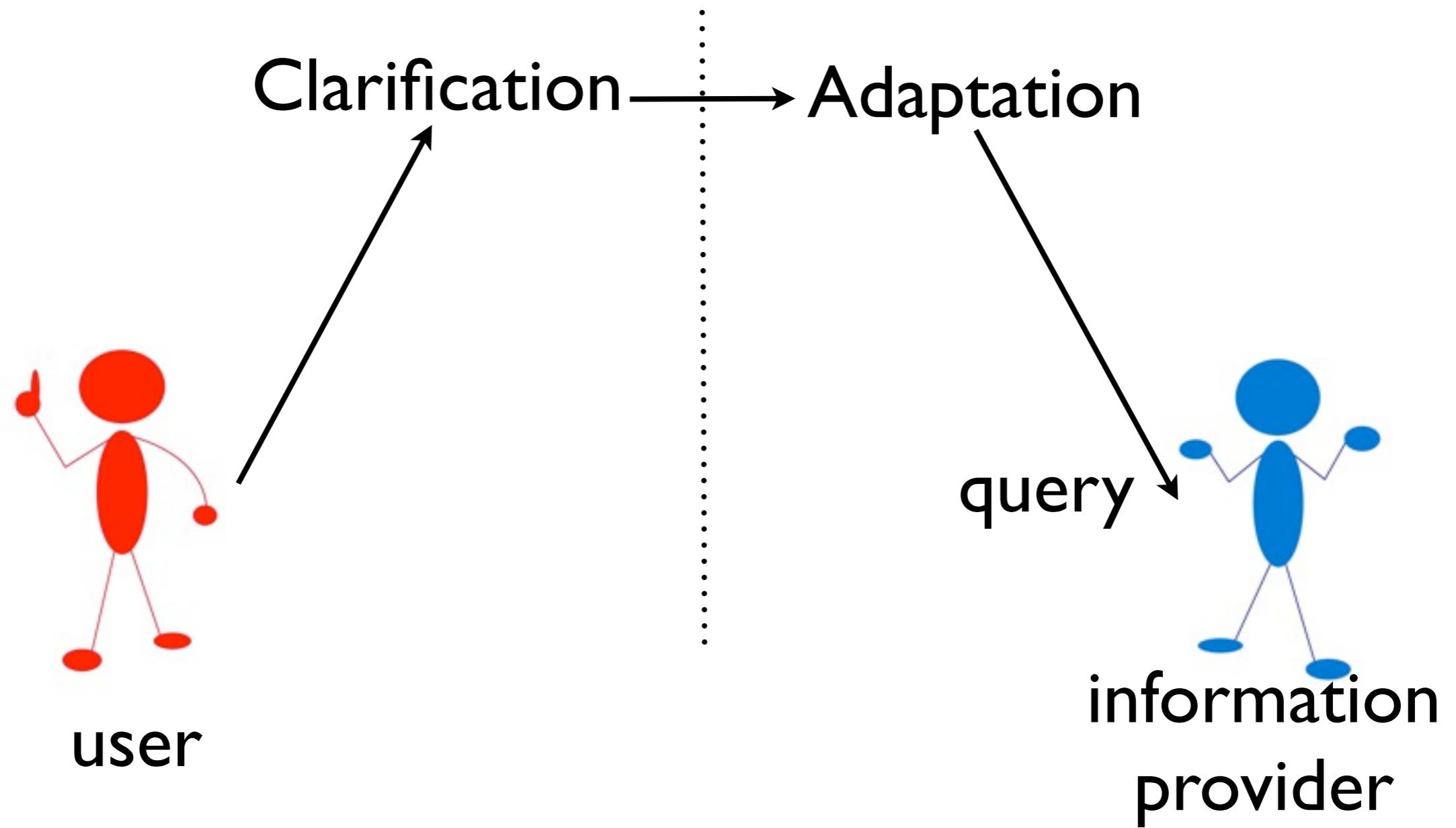
Our Main Idea



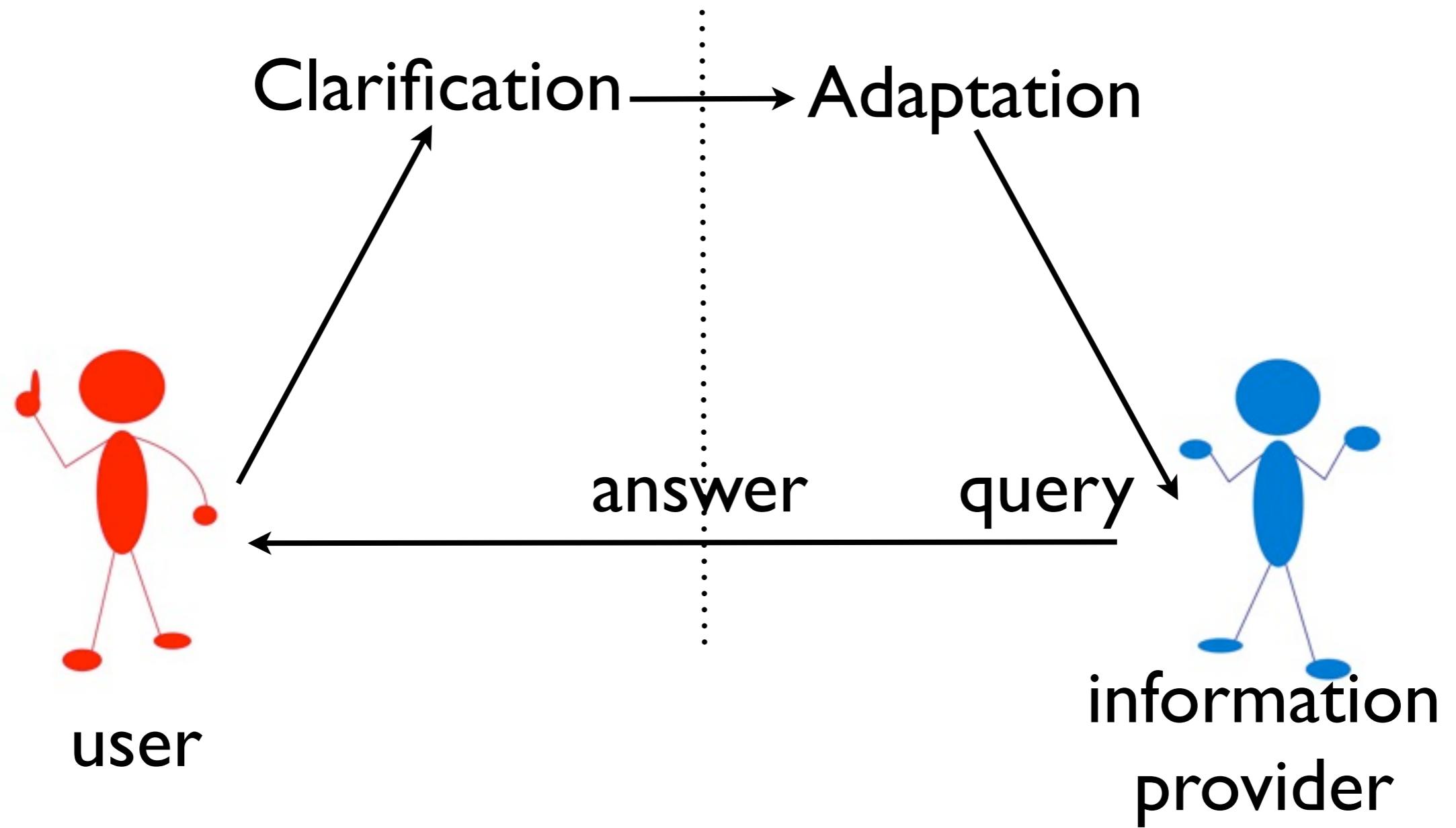
Our Main Idea



Our Main Idea



Our Main Idea



Our Main Idea

- Query clarification
- Document adaptation
- Classical ranking function

- { ✓ User's side
- { ✓ No Expansion
- { ✓ Lightweight
- { ✓ No reindexing
- ✓ Easy

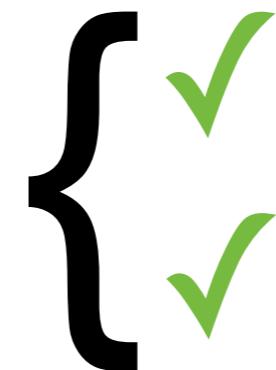


Assumptions

- Implementation with semantic vectors
 - No consideration of metadata
 - No consideration on indexing
 - Pluggable in existing systems
- {

Assumptions

- Implementation with semantic vectors
- No consideration of metadata
- No consideration on indexing
- Pluggable in existing systems



✓ dom. ontologies

Assumptions

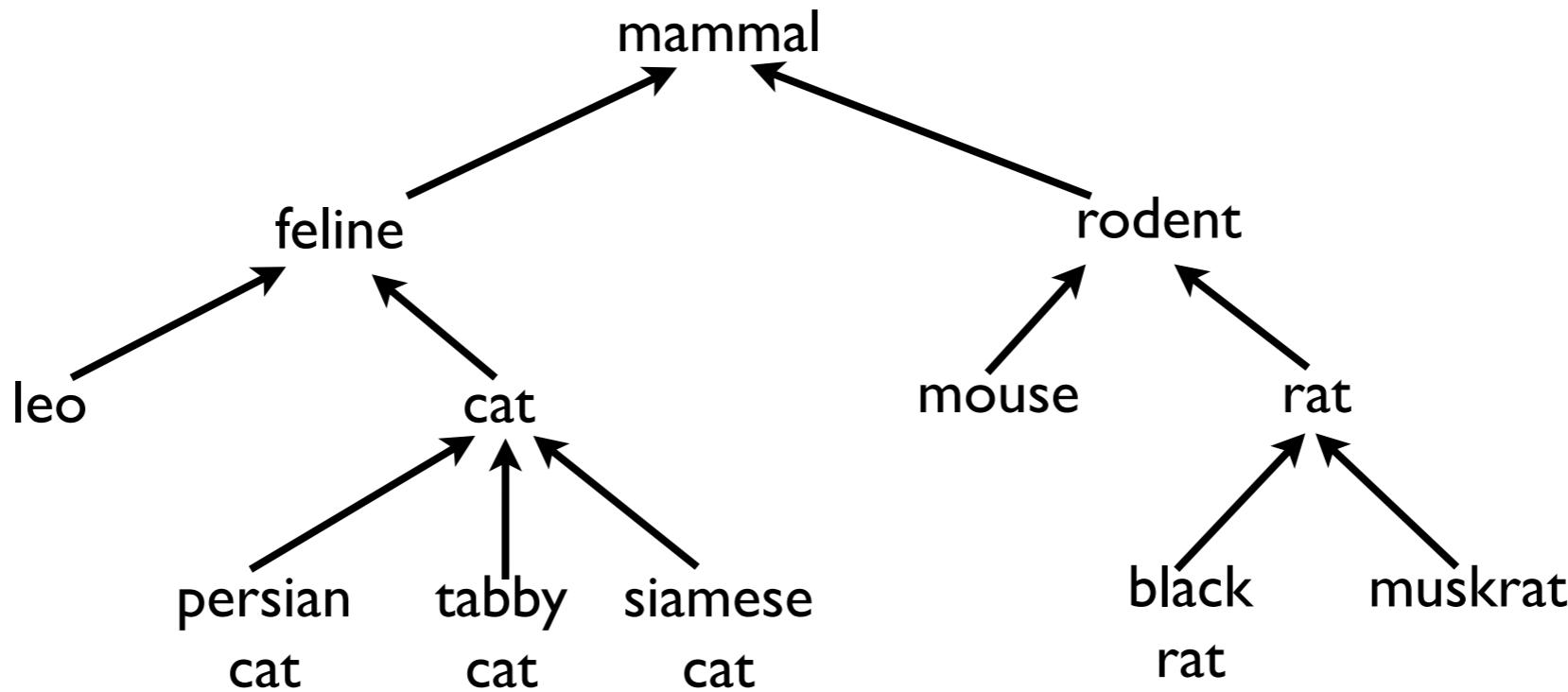
- Implementation with semantic vectors { ✓ dom. ontologies
- No consideration of metadata ? Out of our scope
- No consideration on indexing ? "
- Pluggable in existing systems



Assumptions

- Implementation with semantic vectors { ✓ Less ambiguity
- No consideration of metadata { ✓ dom. ontologies
- No consideration on indexing { ? “
- Pluggable in existing systems { ✓ Convenient

Semantic Vectors



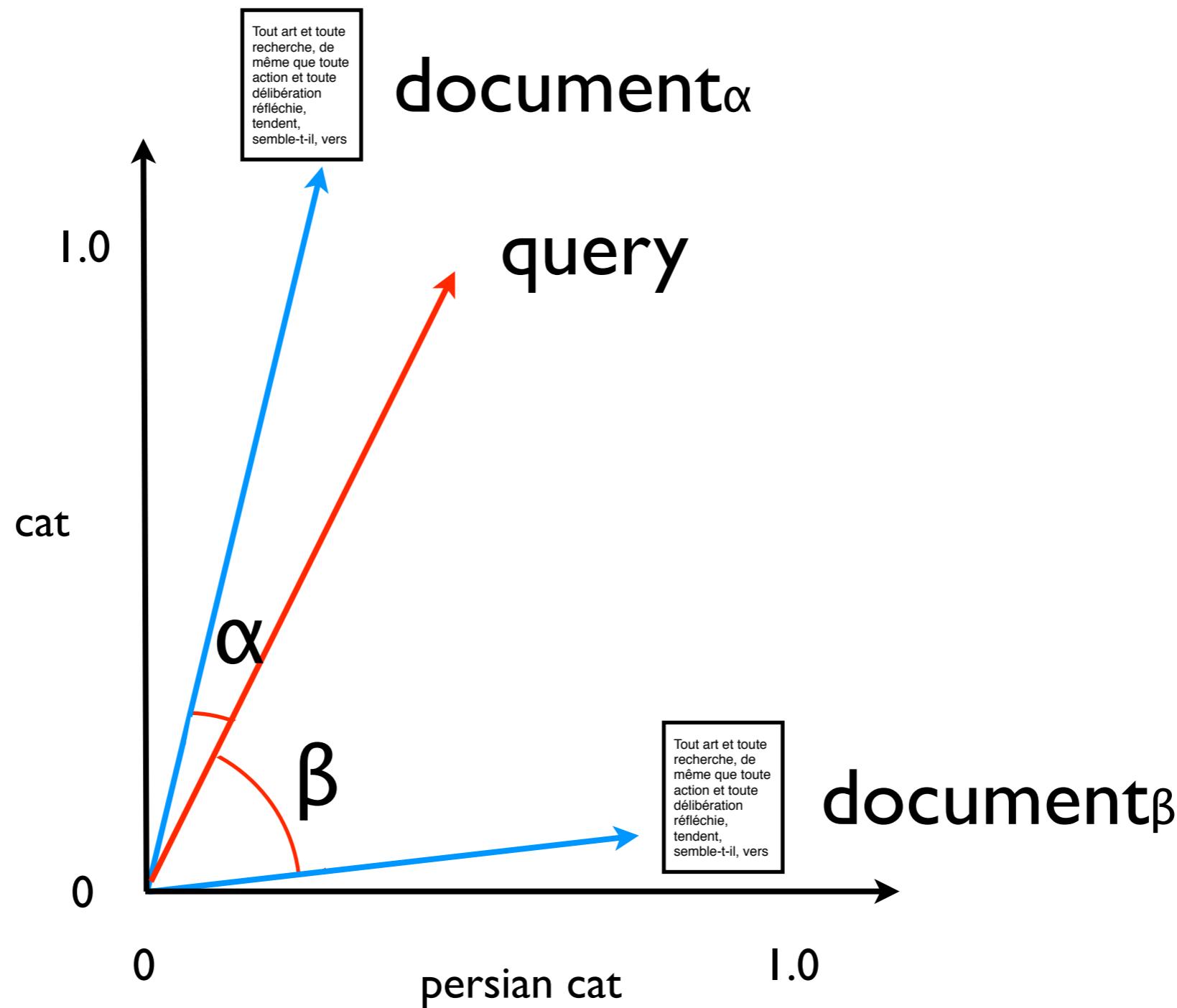
mammal feline rodent mouse rat black rat muskrat leo cat persian cat tabby cat siamese cat



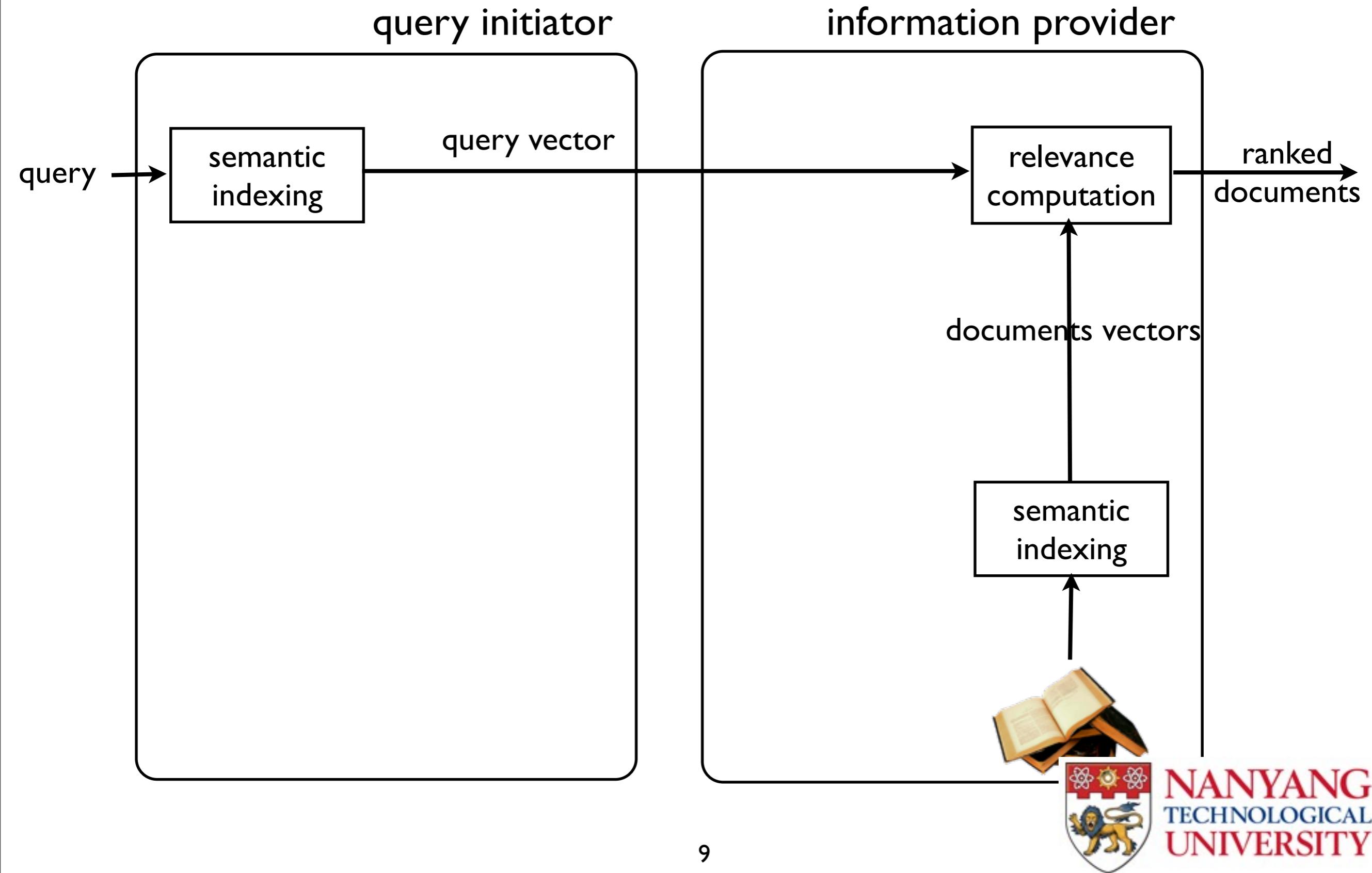
?

Tout art et toute recherche, de même que toute action et toute délibération réfléchie, tendent, semble-t-il, vers

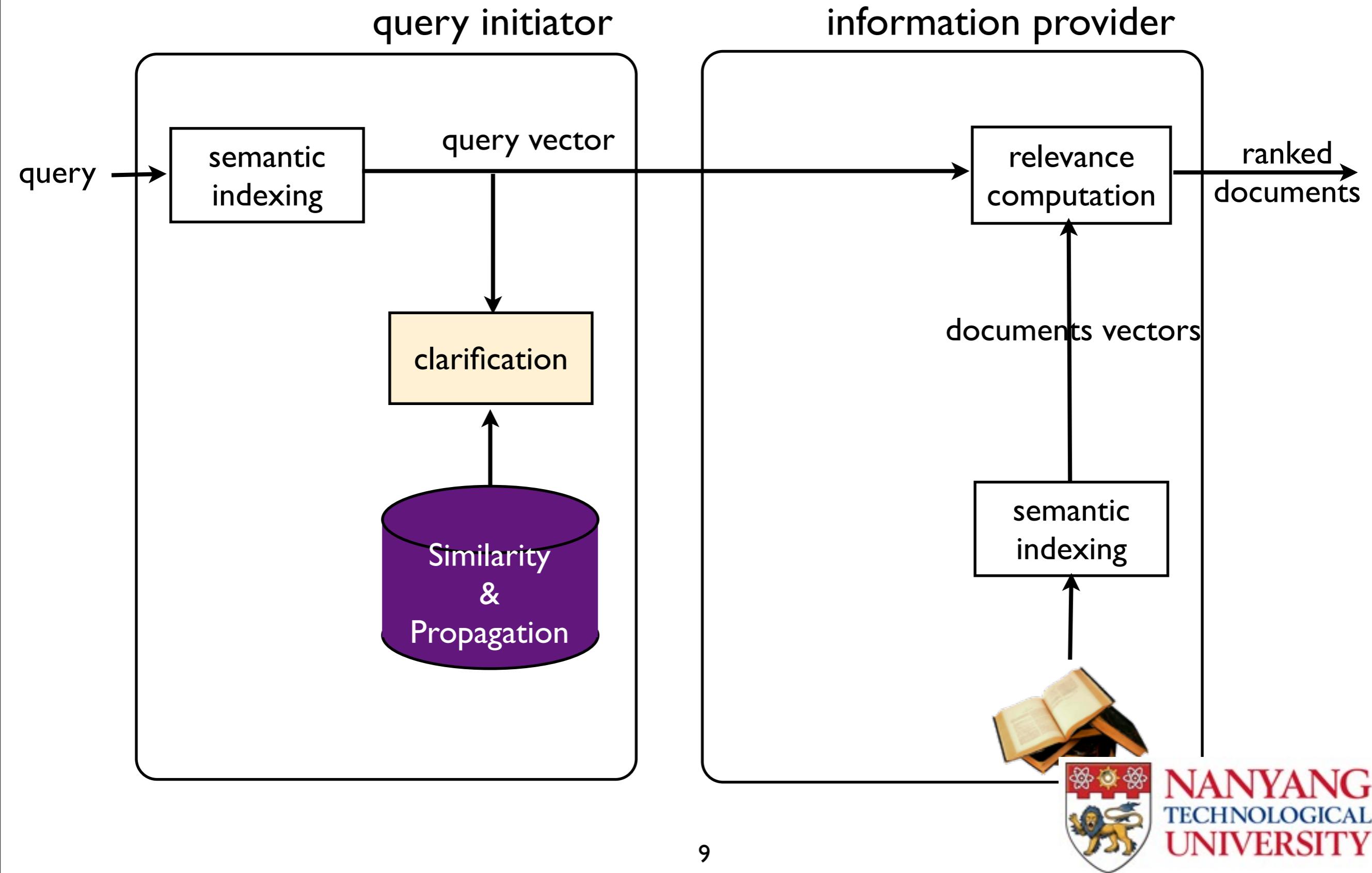
Cosine



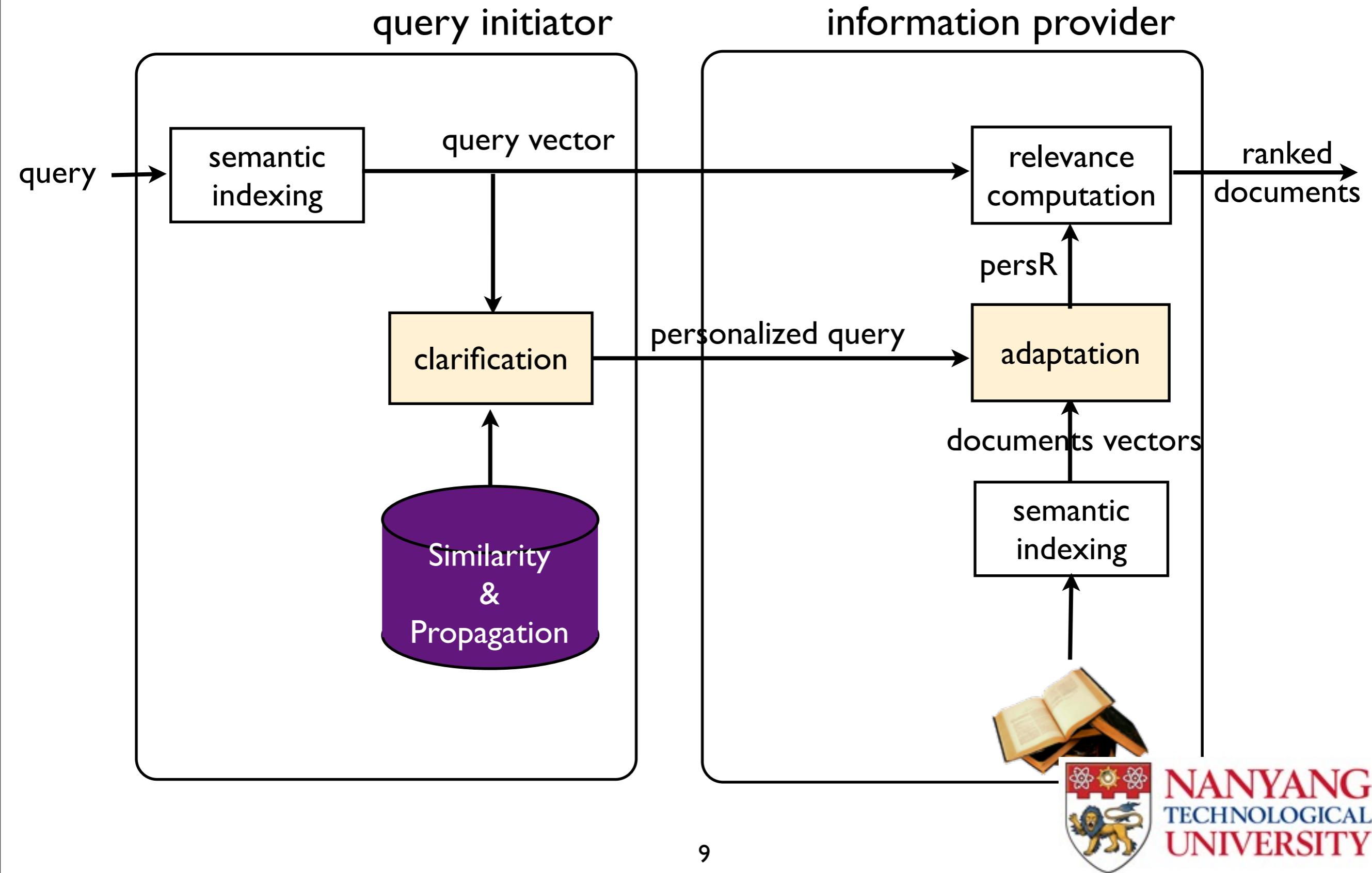
System Architecture



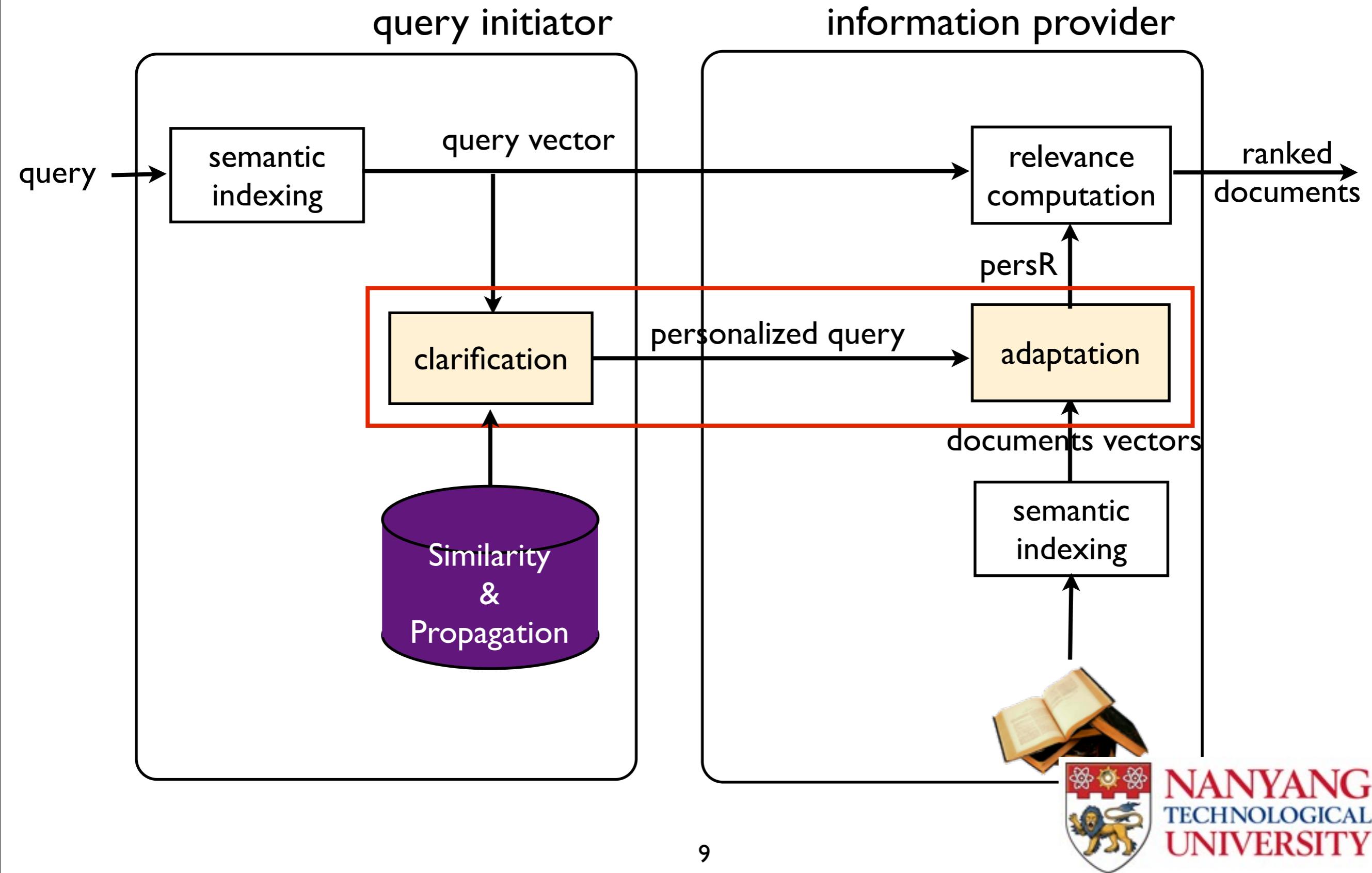
System Architecture



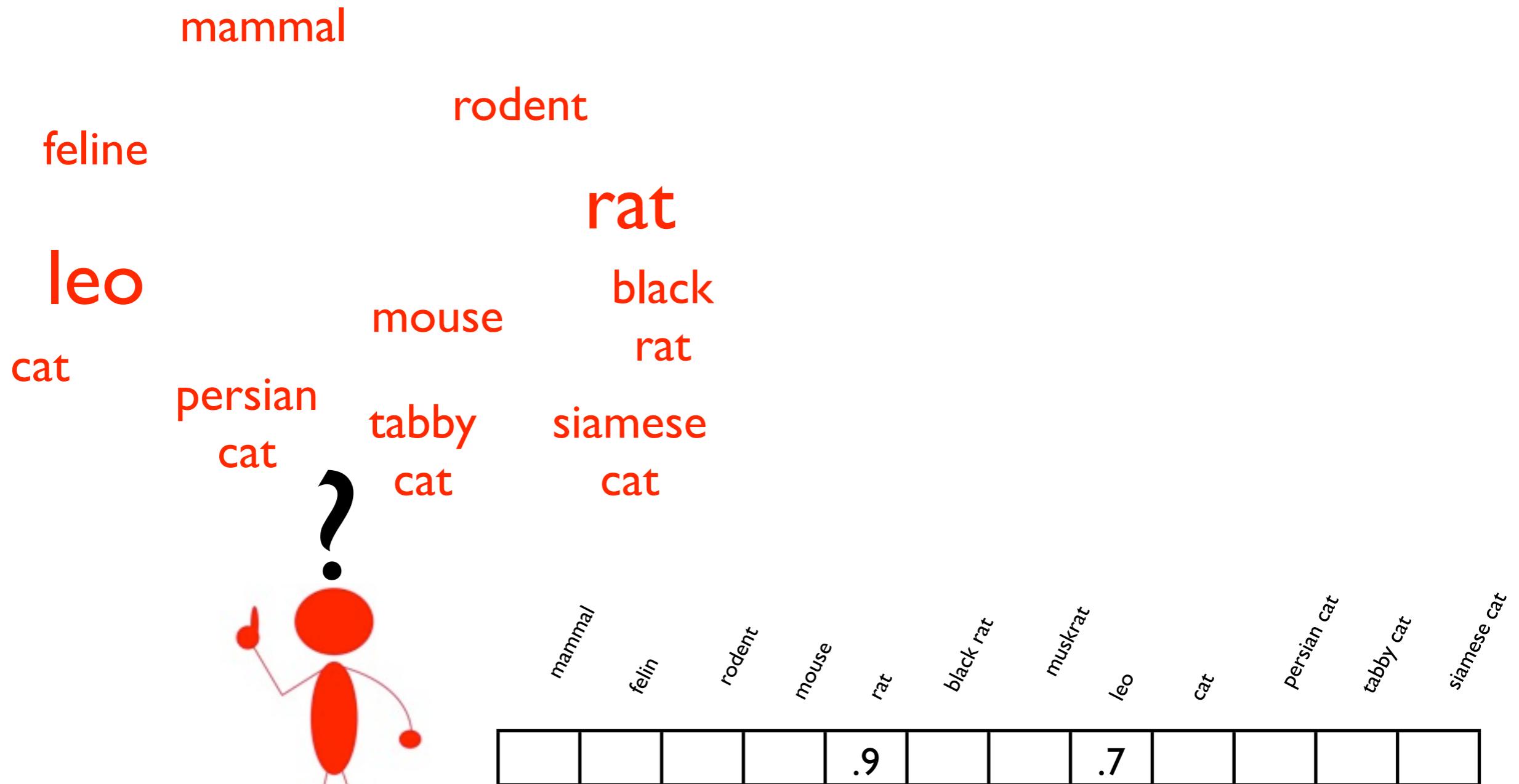
System Architecture



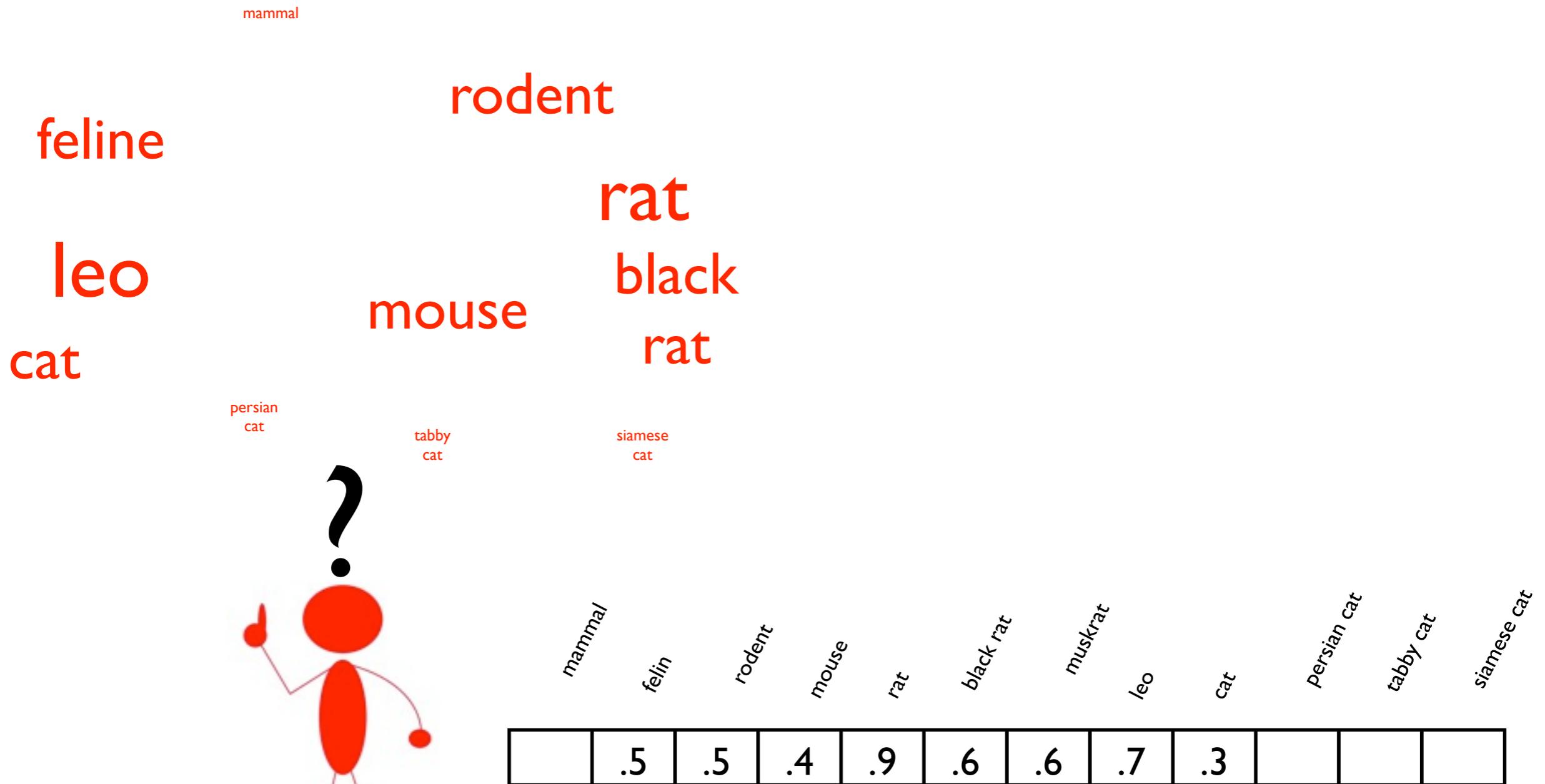
System Architecture



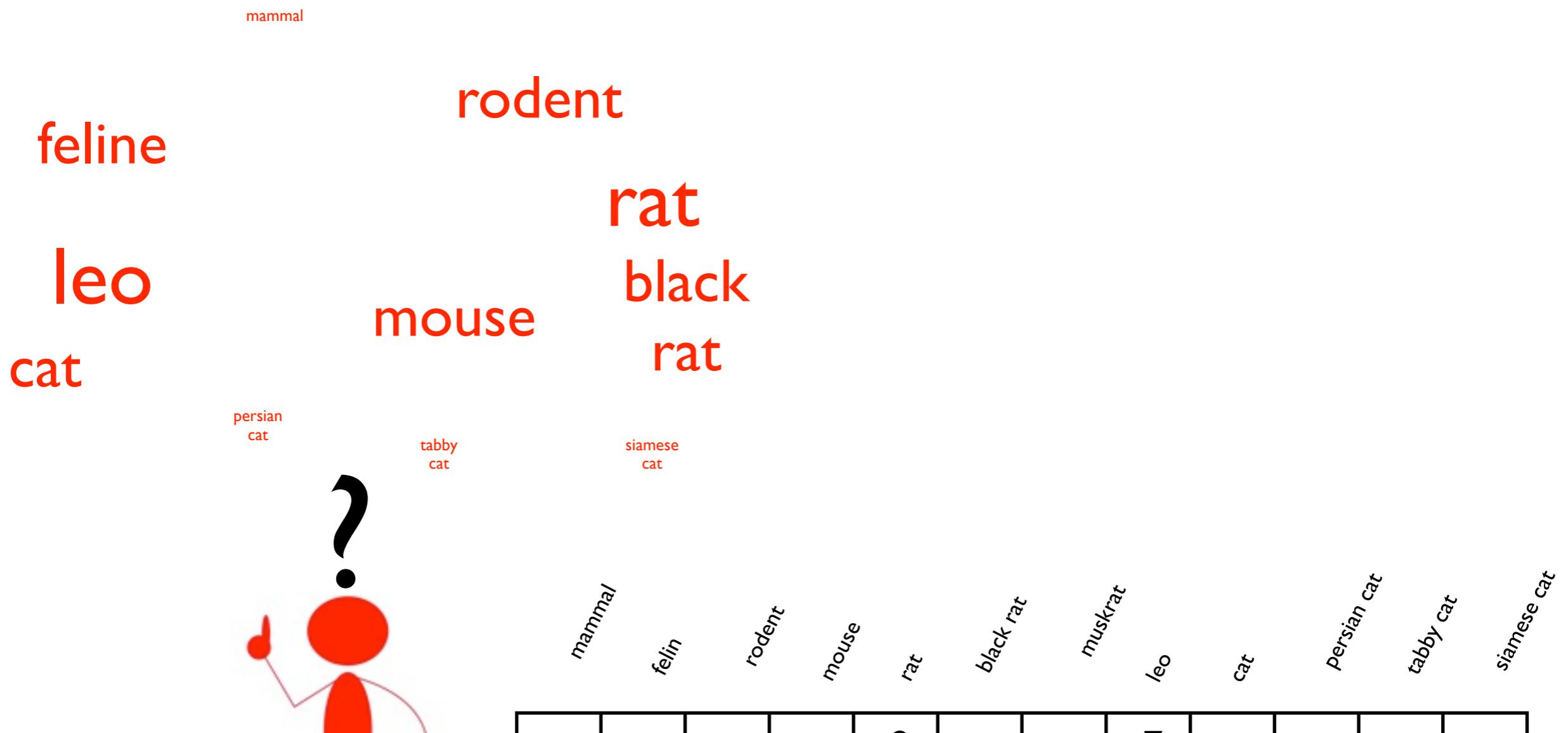
Query Expansion



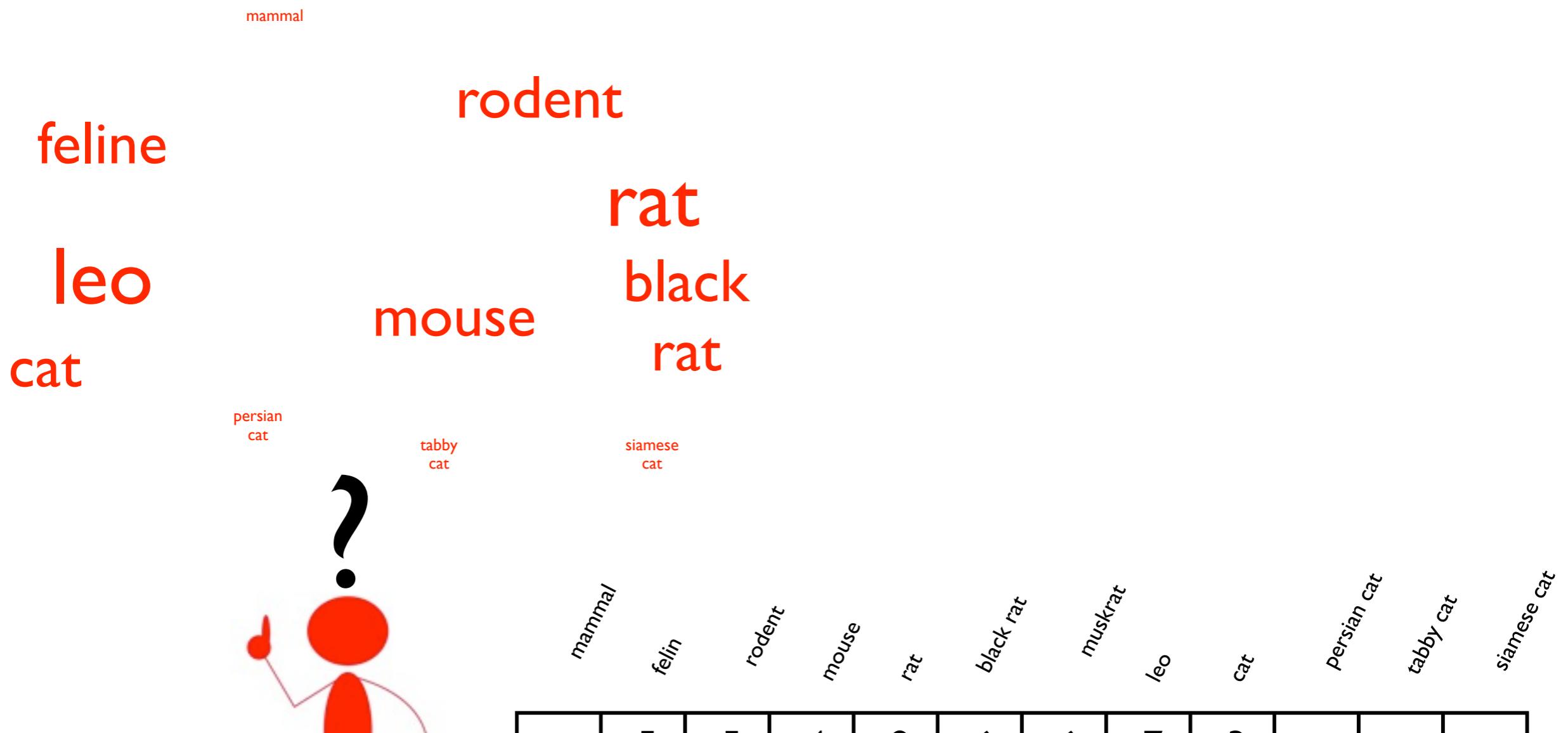
Query Expansion



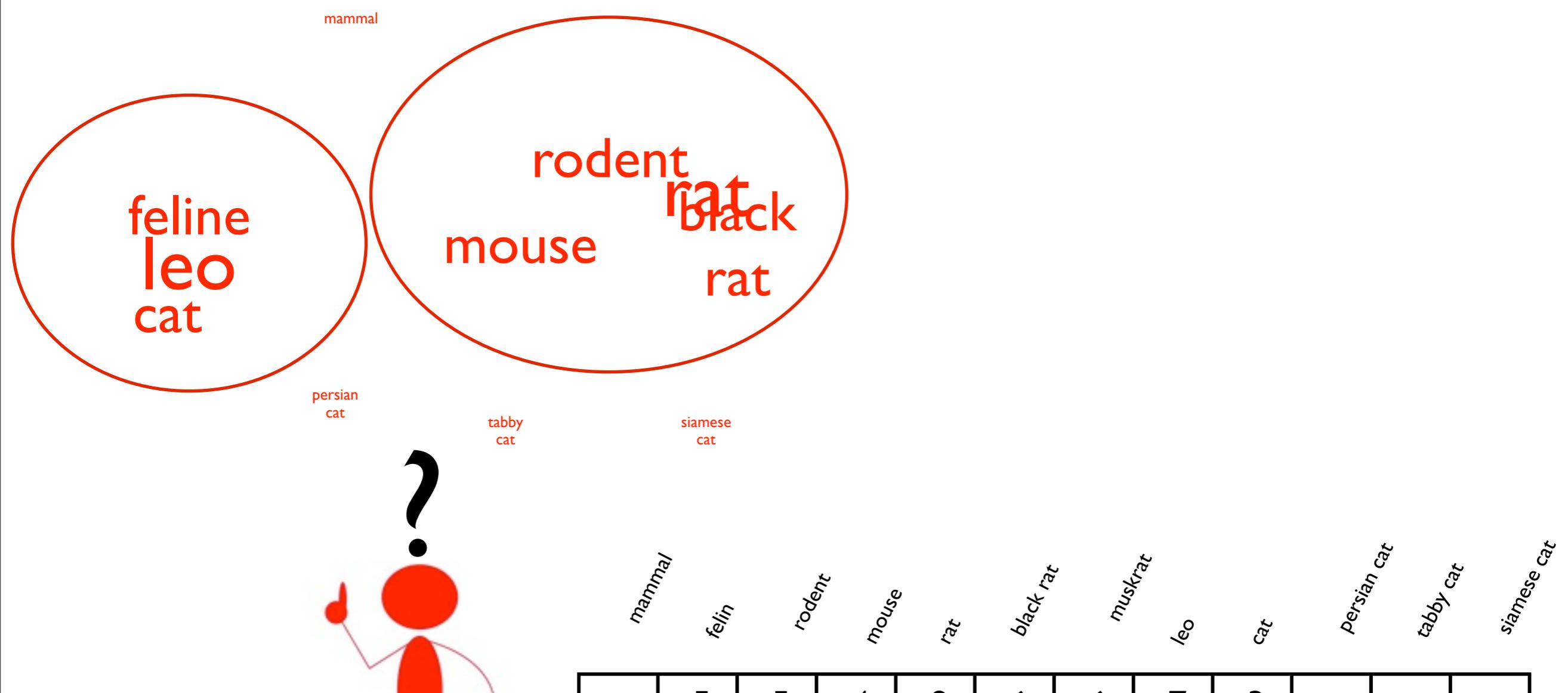
Clarification



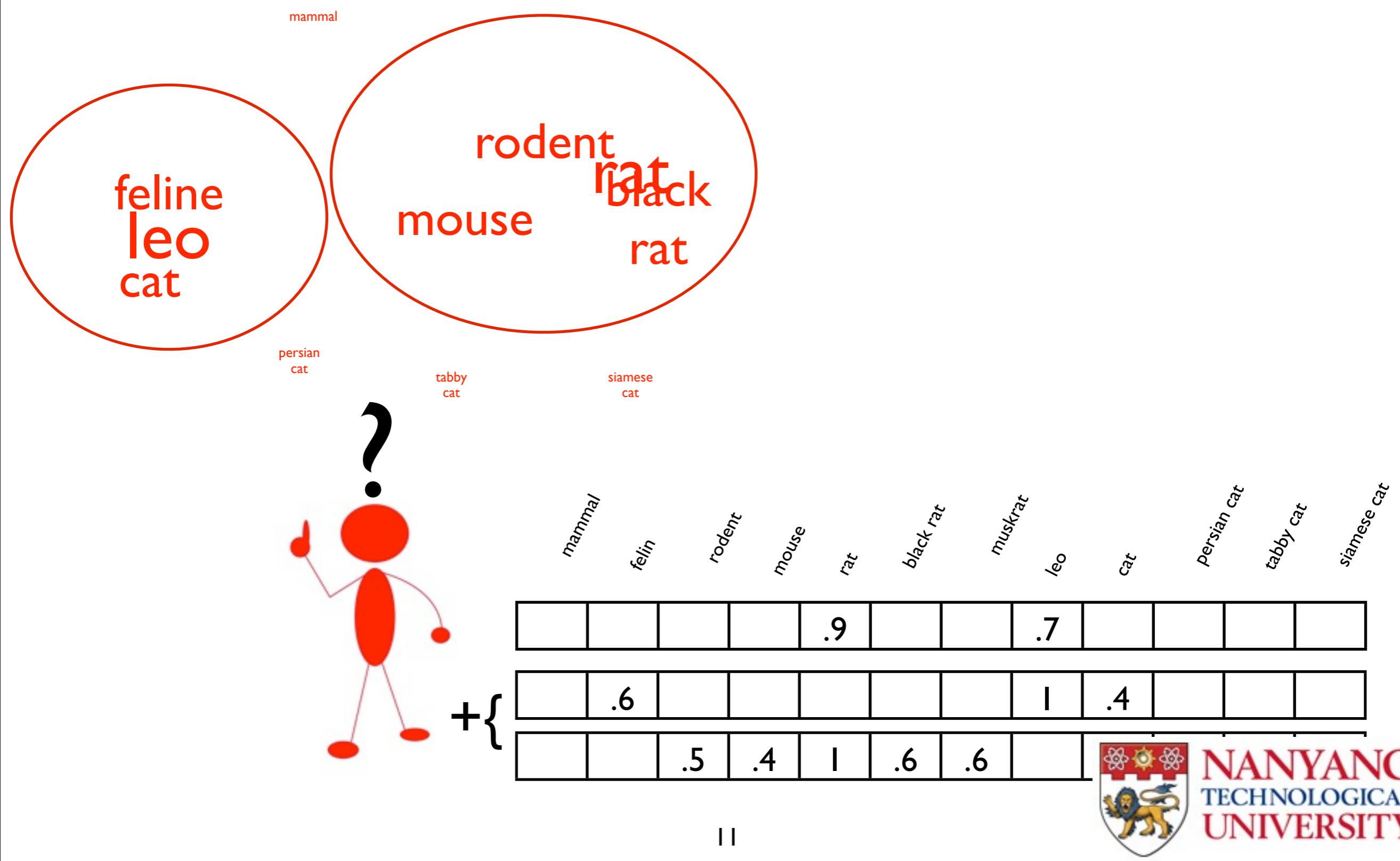
Clarification



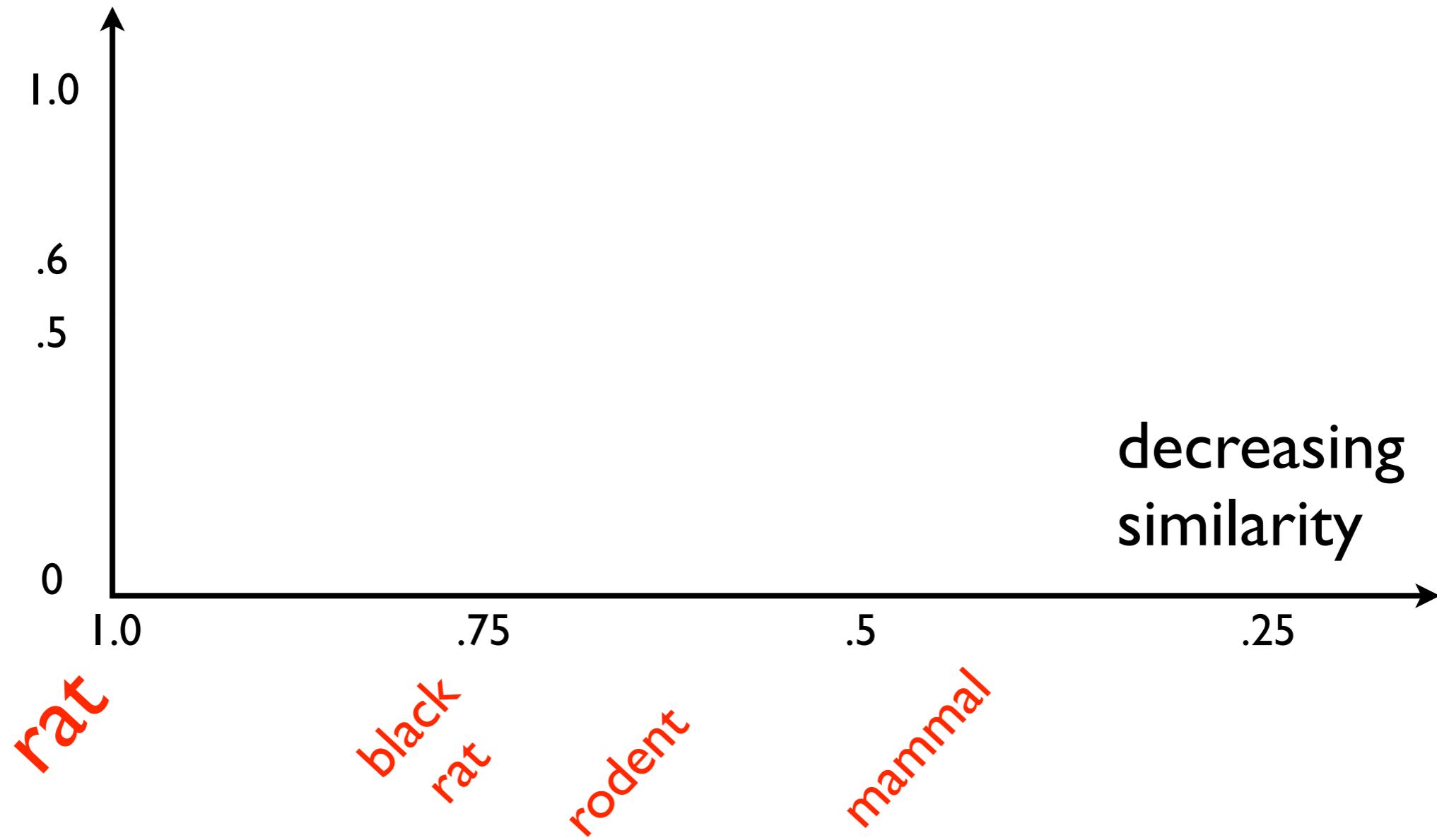
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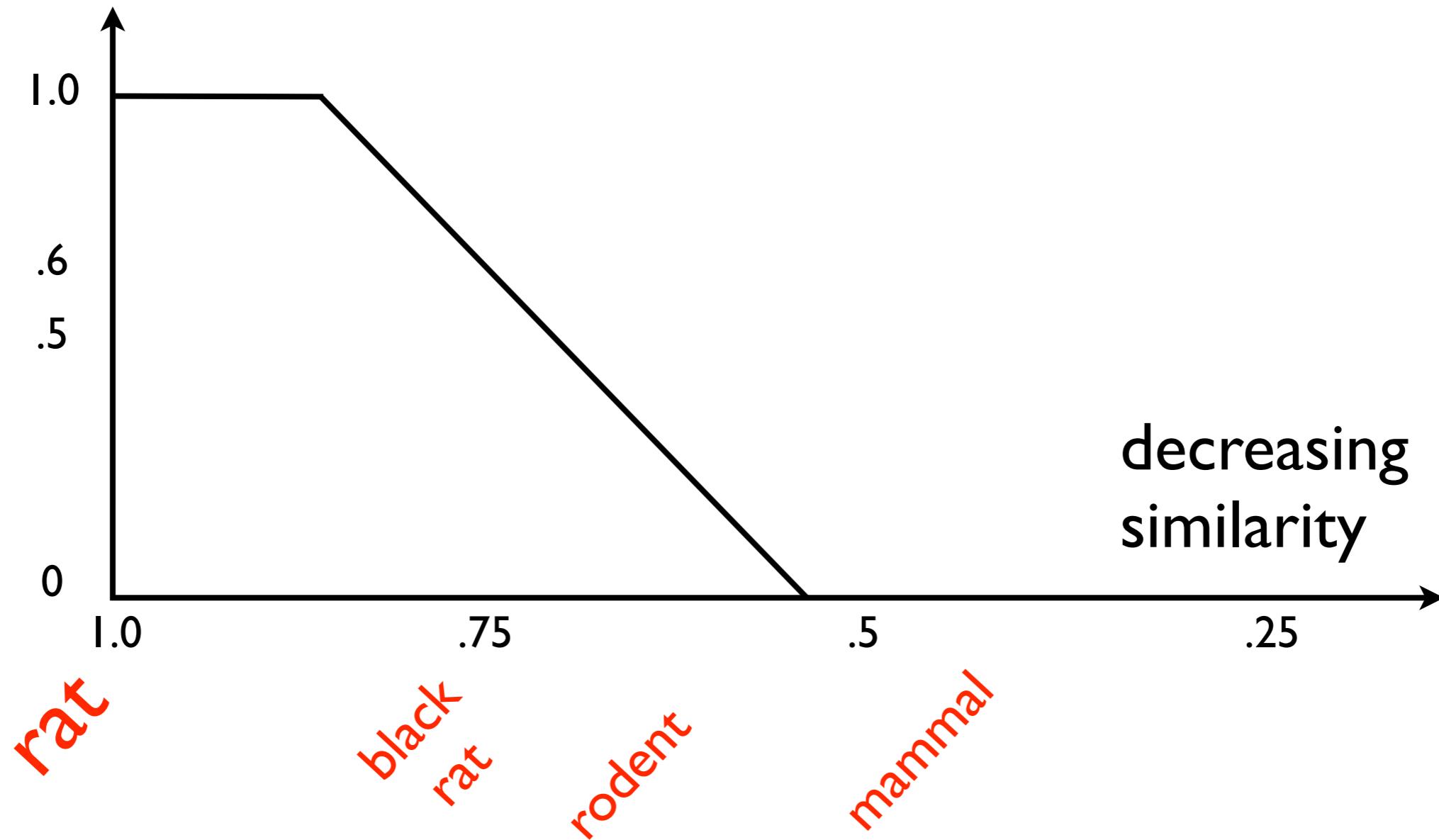
Clarification



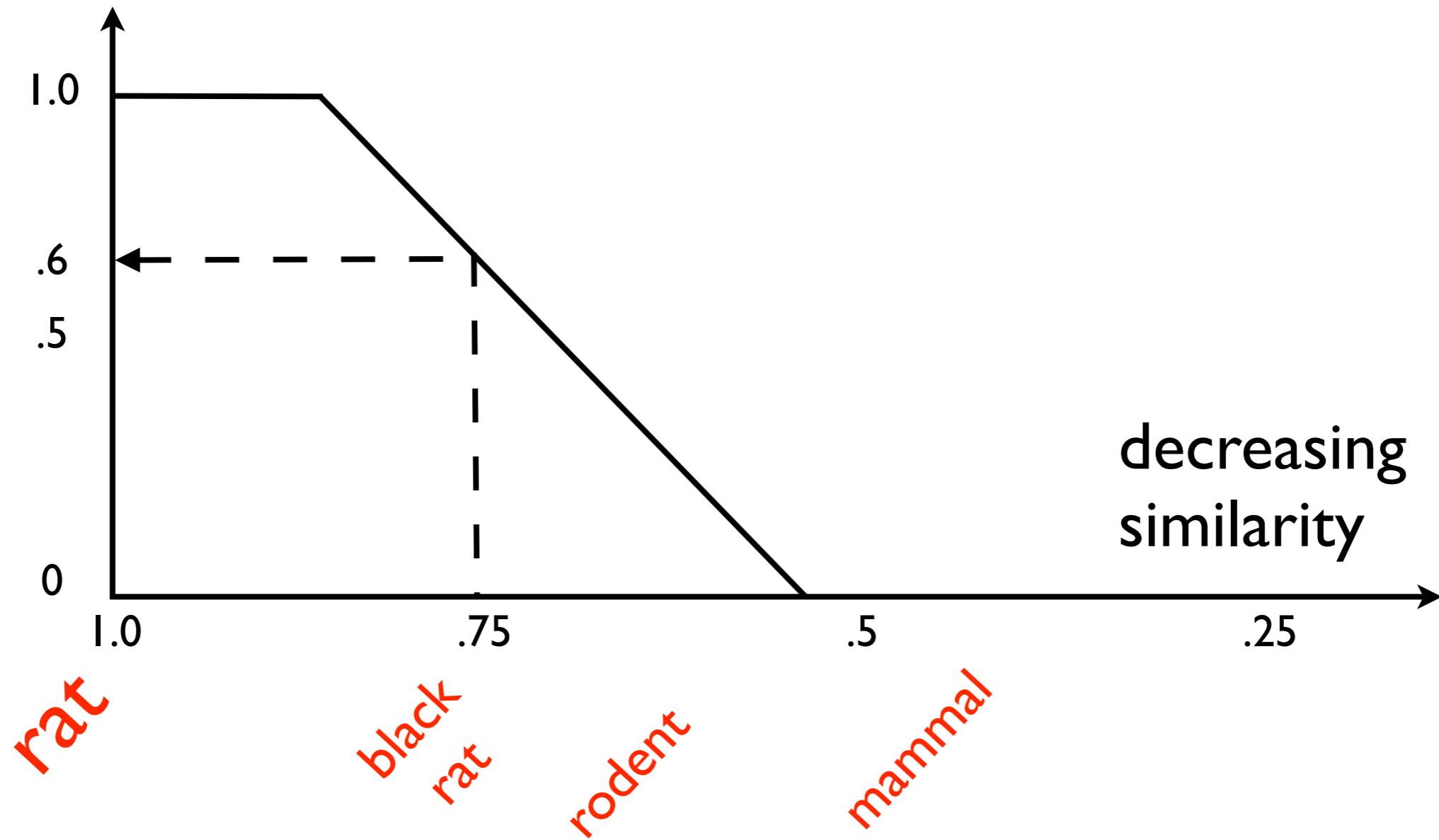
Similarity & Propagation



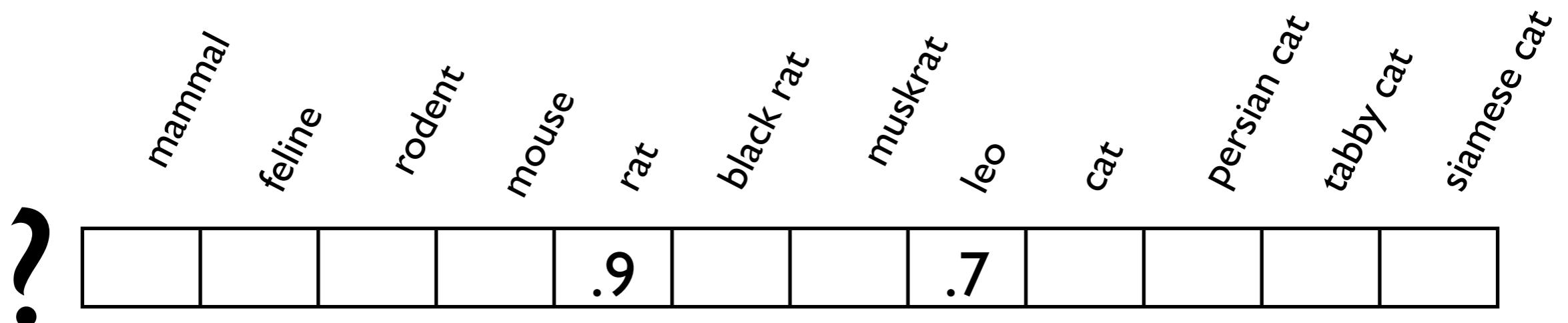
Similarity & Propagation



Similarity & Propagation

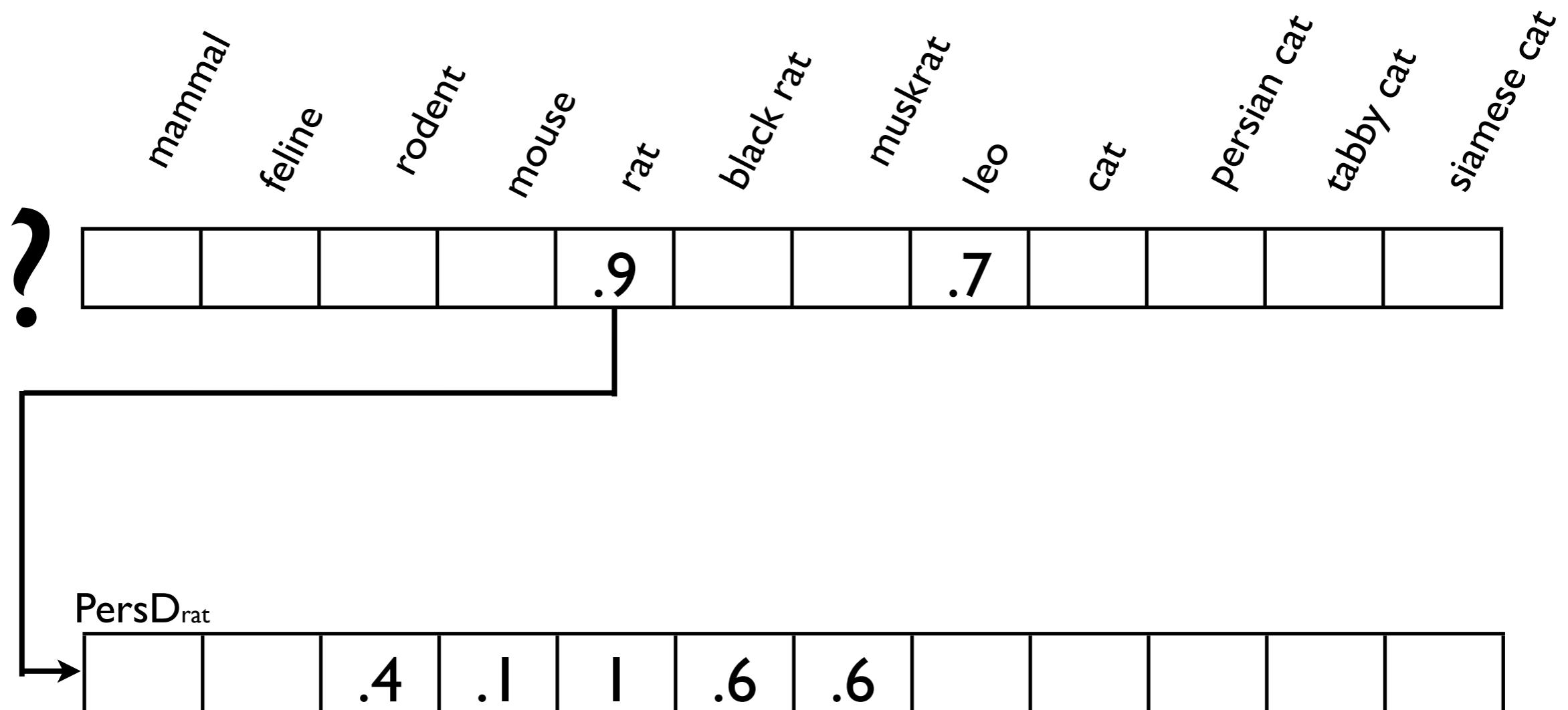


PersD

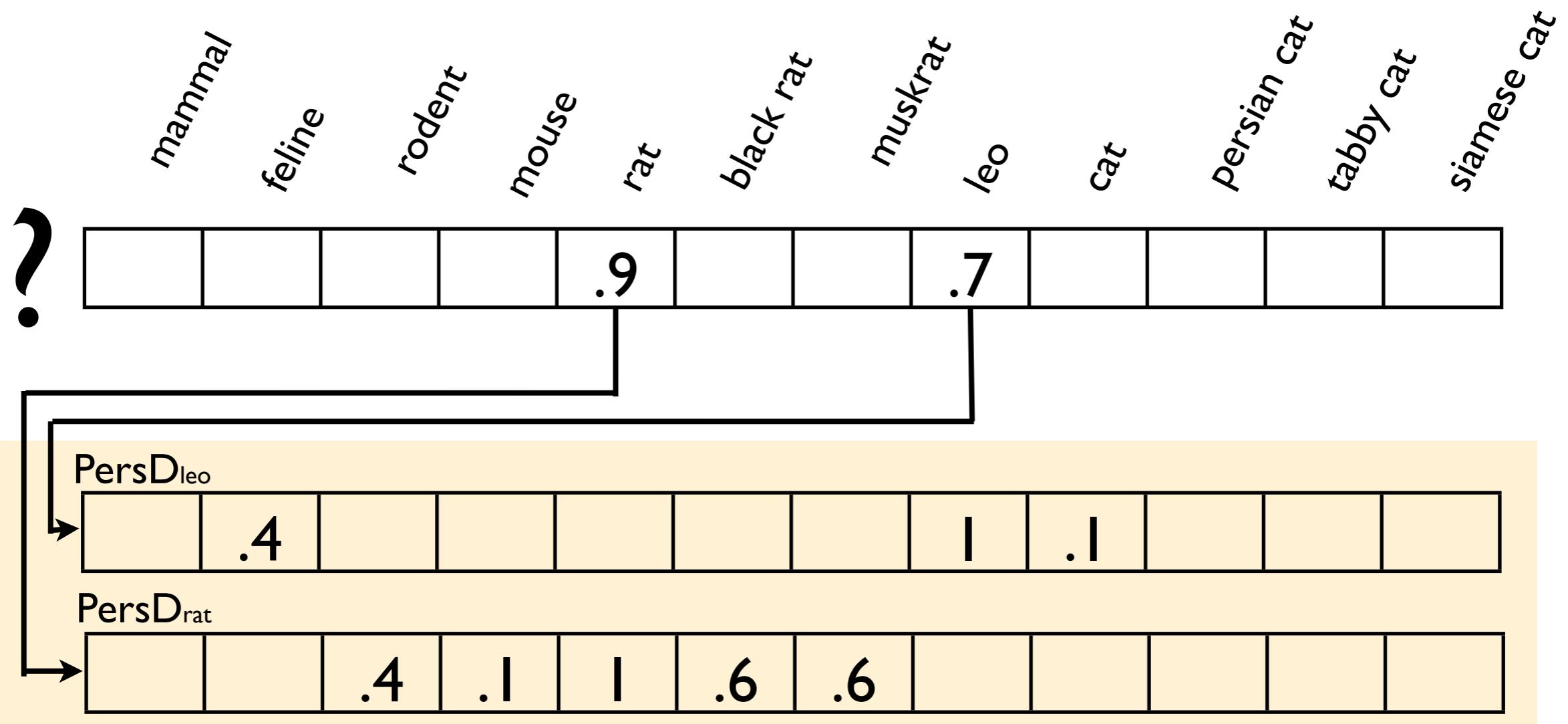


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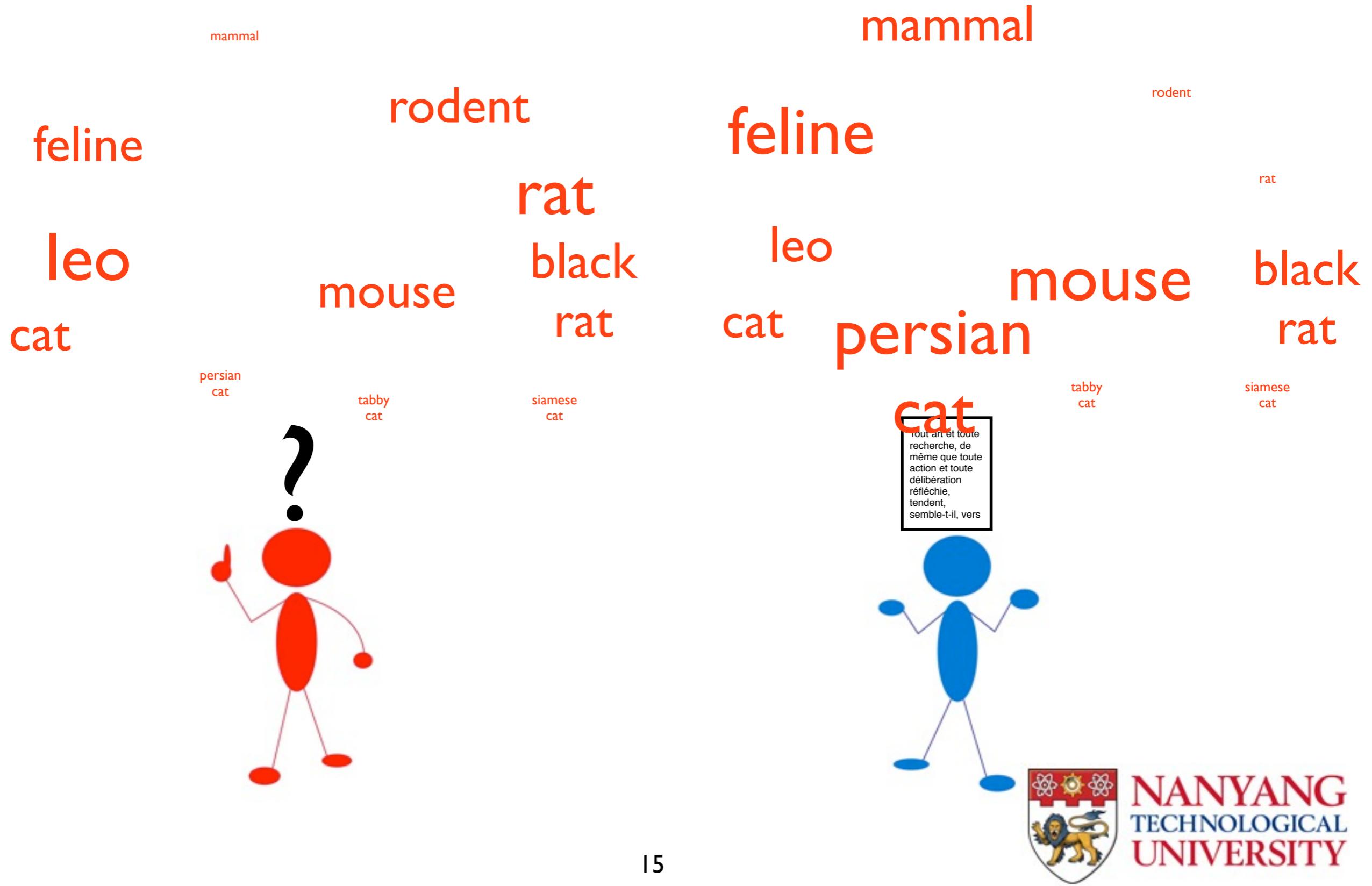
PersQ



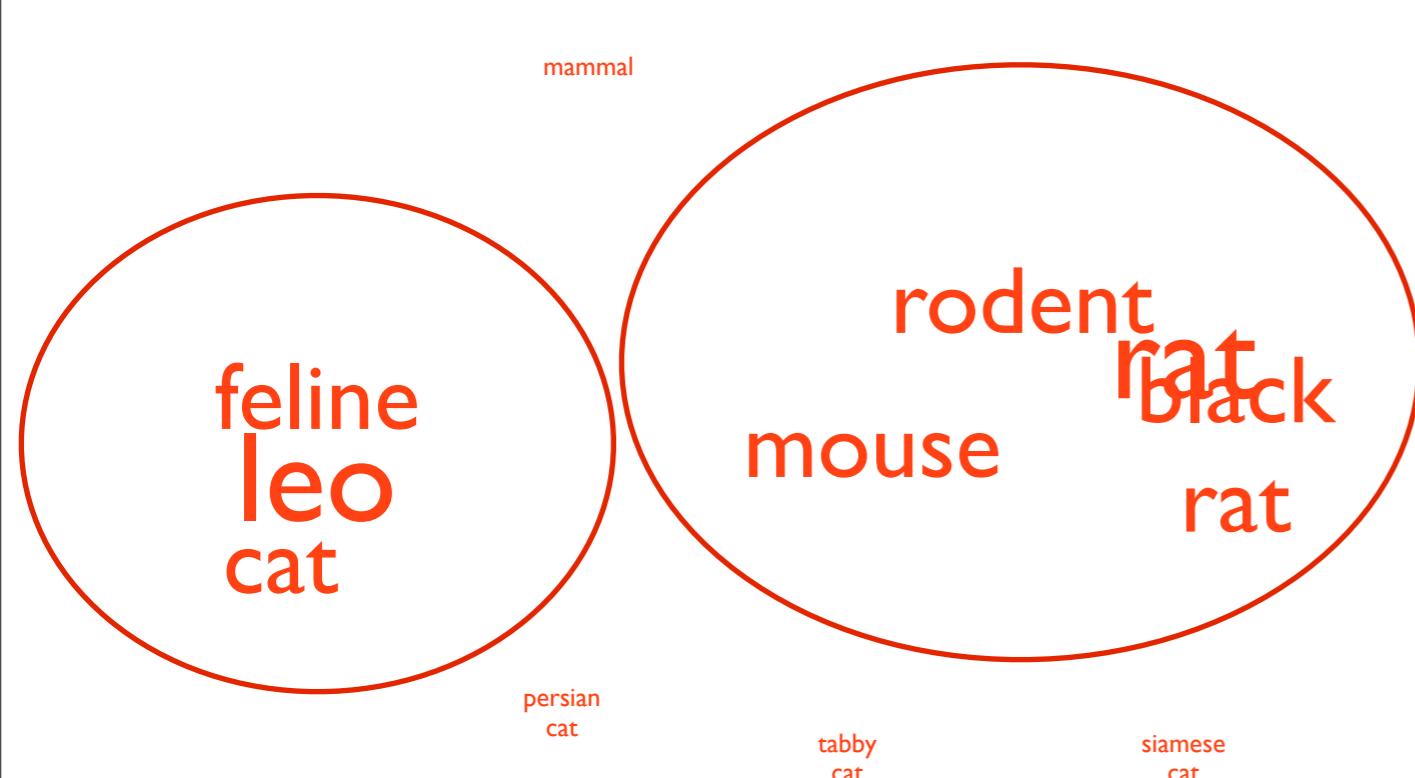
PersQ



PersR



PersR



mammal
feline
leo
cat
persian
mouse
black
rat
rodent
rat
mammal

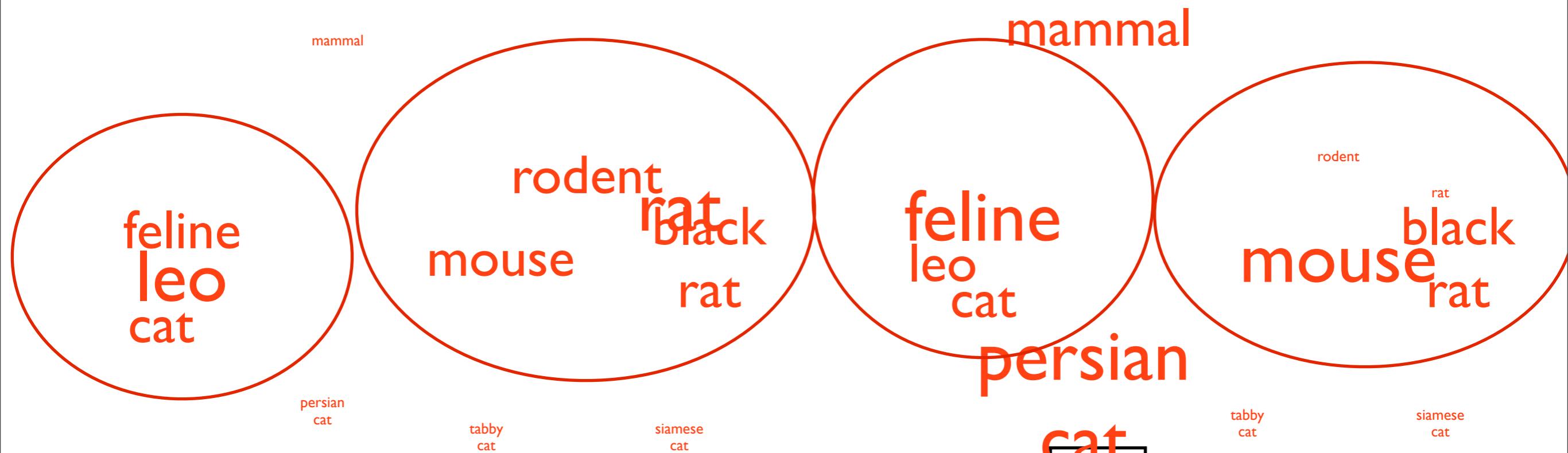
cat

tout art et toute
recherche, de
même que toute
action et toute
délibération
réfléchie,
tendent,
semble-t-il, vers



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PersR



cat

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Adaptation of a Document

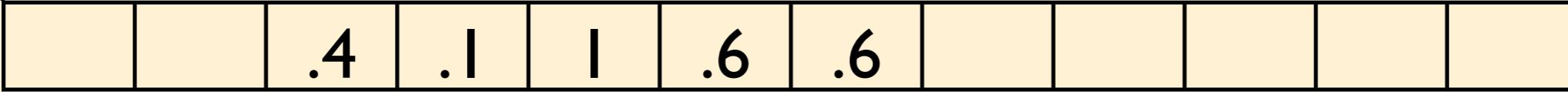
?



persD_{leo}



persD_{rat}



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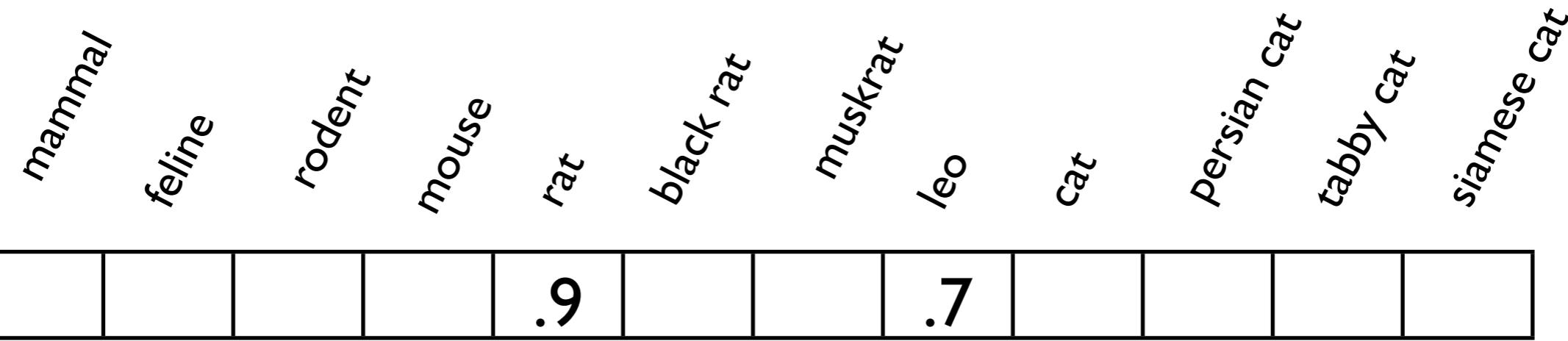
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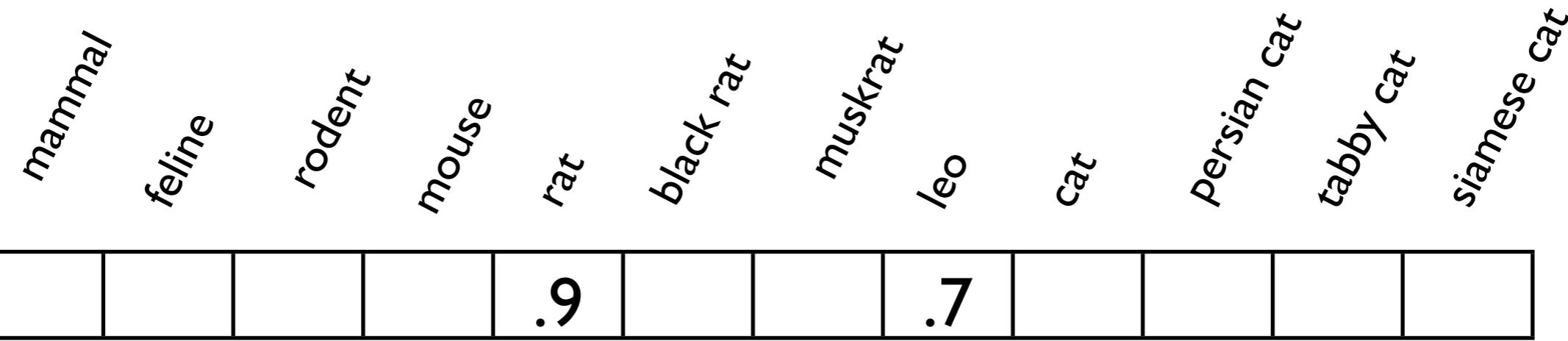


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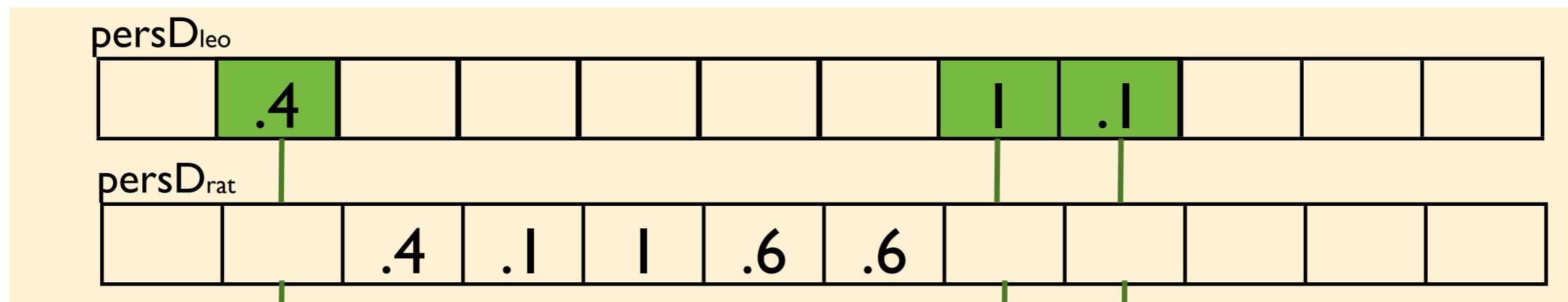
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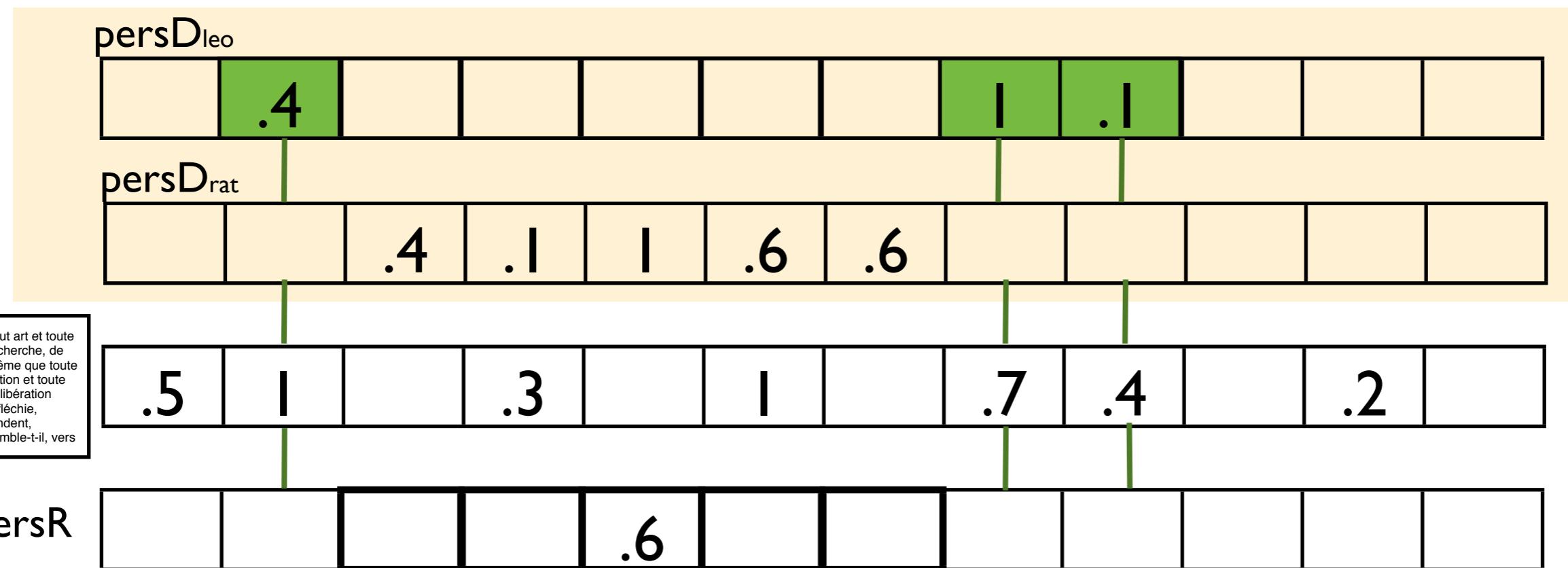


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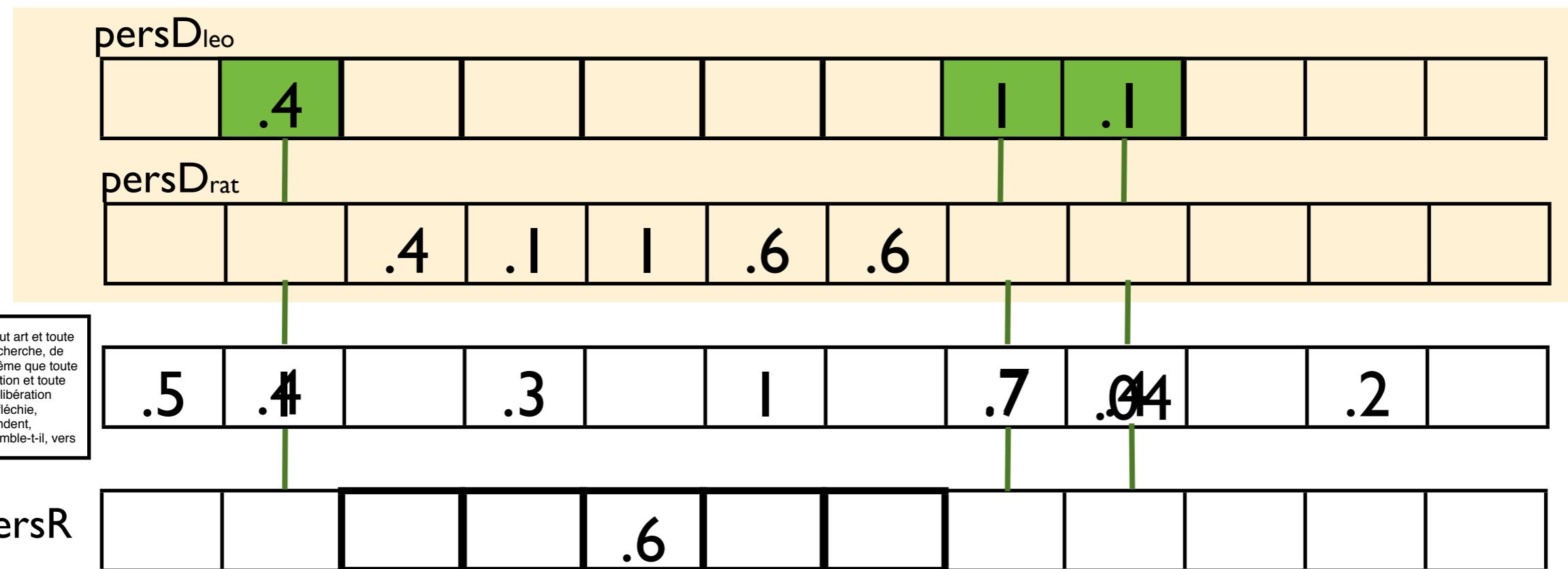
Adaptation of a Document

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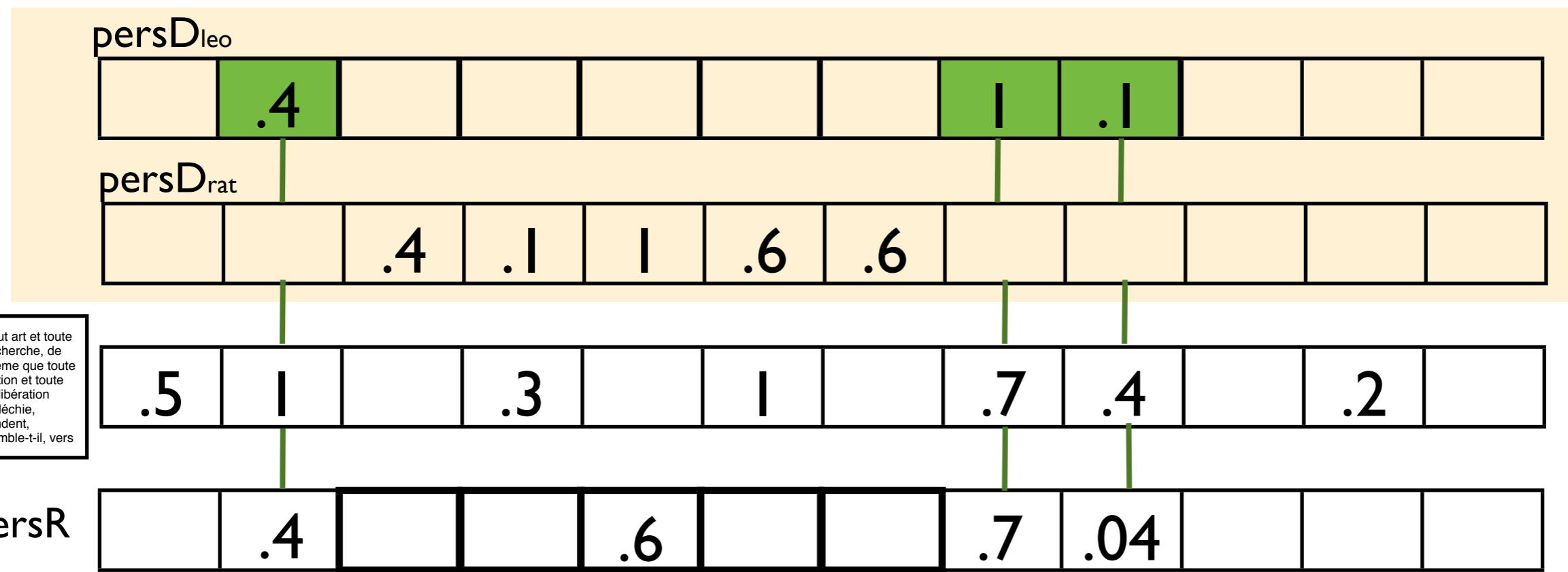
Adaptation of a Document

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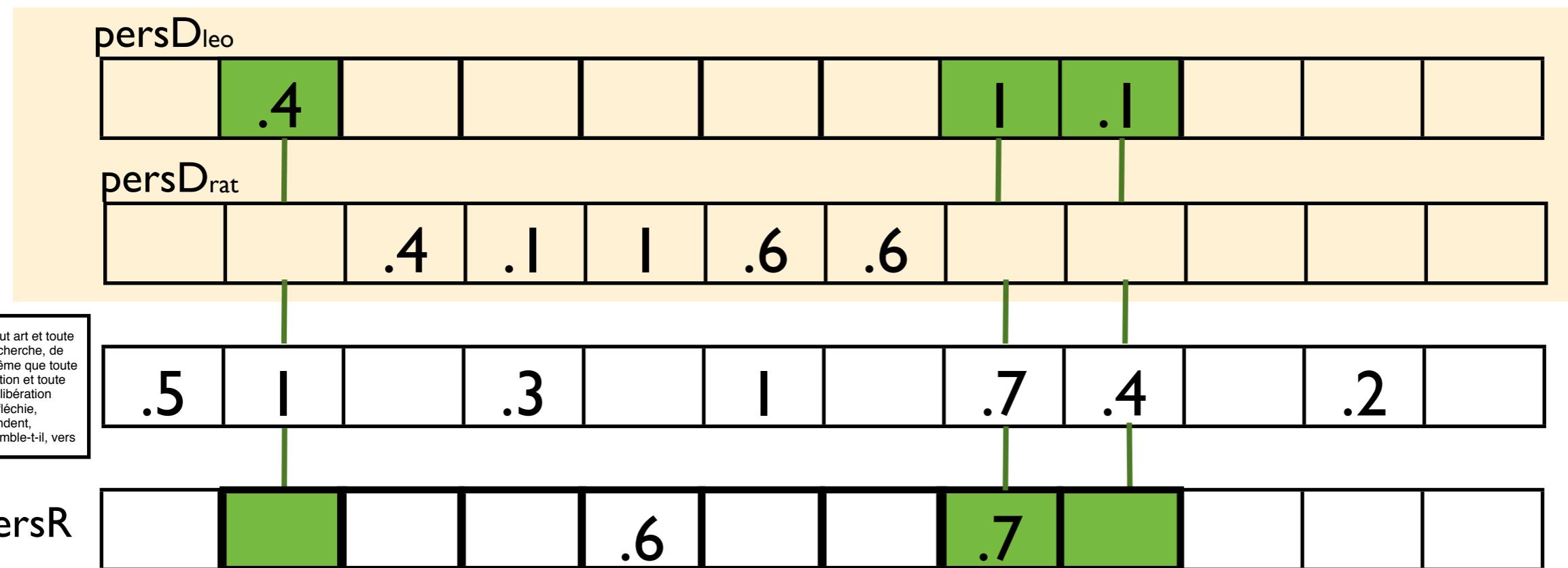
Adaptation of a Document

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Adaptation of a Document

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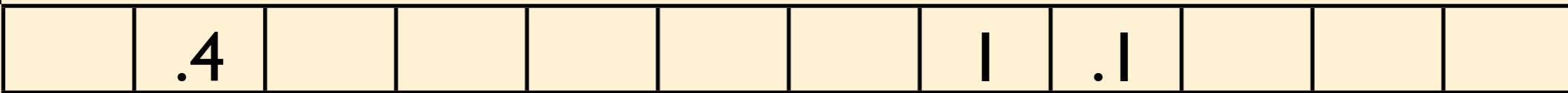


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Context of Exp. I

Ontology: WordNet 1.7.1

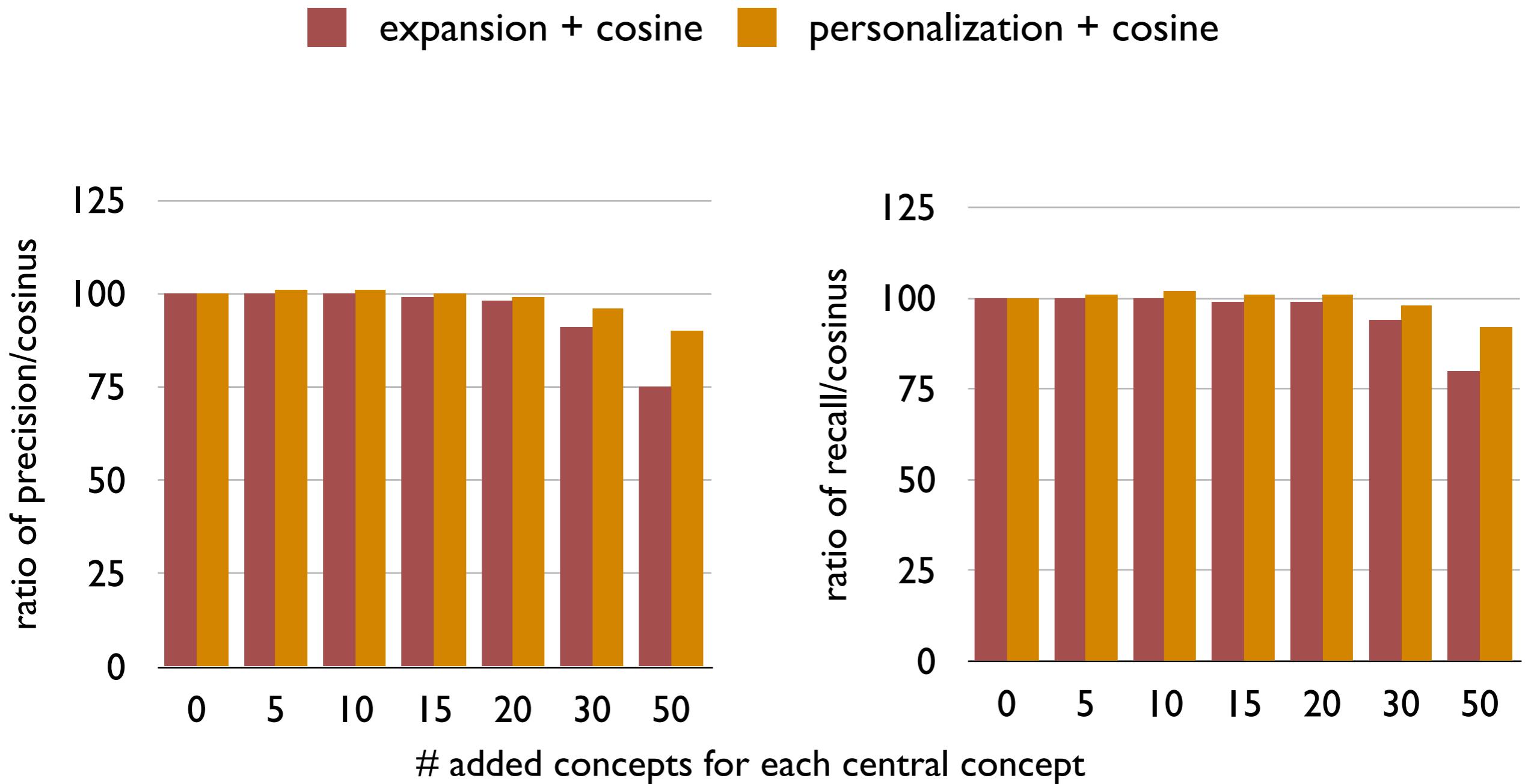
Corpus: Cranfield, 1400 documents and 225 queries in natural language, all from the field of aeronautical engineering. Boolean relevance of each document wrt. each query.

Semantic Indexing: RII0, from a NLP team of the LINA.

Other techniques: Cosine (classical measure in IR), expansion and personalization.



Results



Context of Exp. 2

Similarities:

(S1) Wu&Palmer

(S2) Modified Wu&Palmer (permutations of first sim. values)

Propagations:

(P1) narrow (0.95, 0.9)

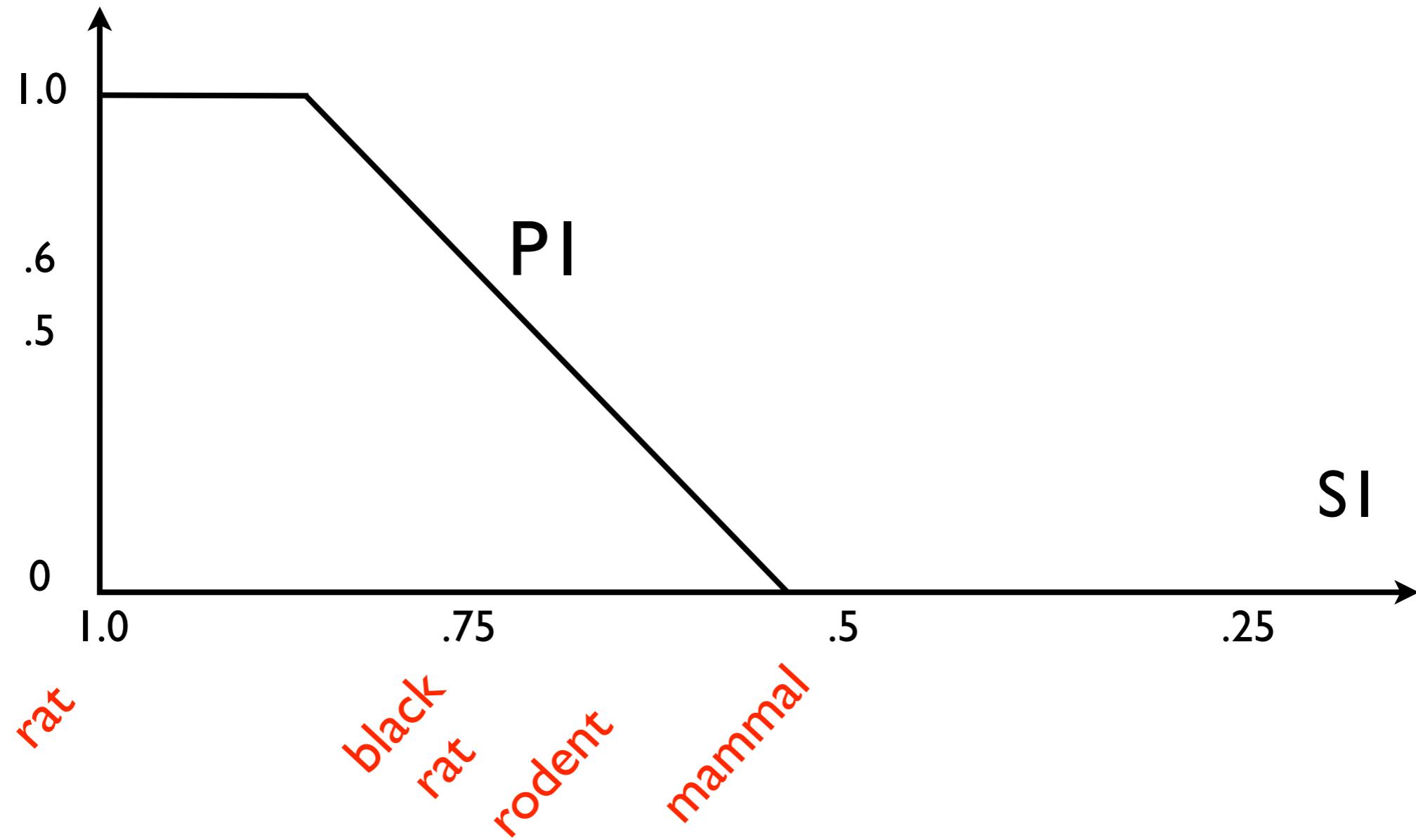
(P2) normal (0.8, 0.6)

Metrics:

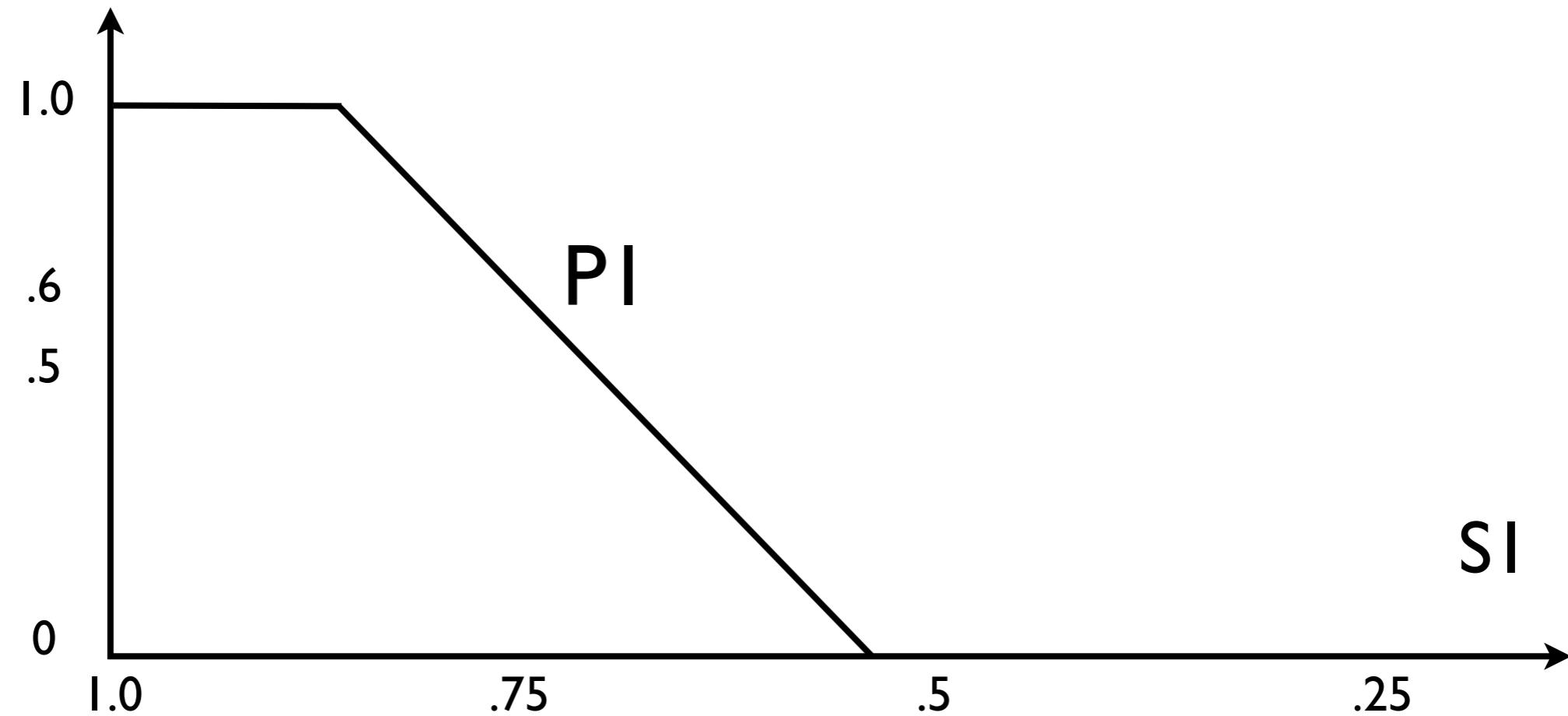
(M1) Jaccard

(M2) home made Rank Distance

Context of Exp. 2



Context of Exp. 2

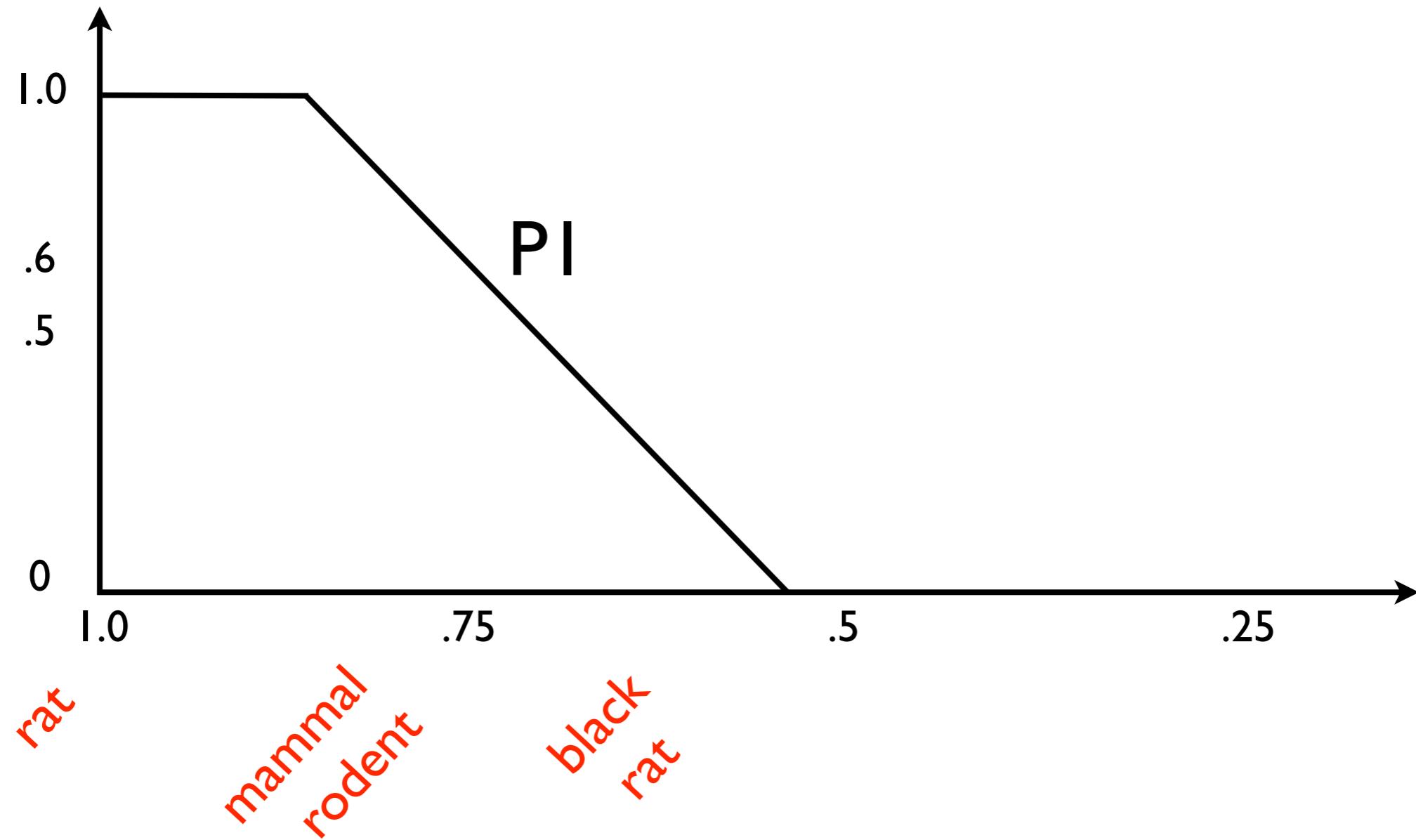


rat

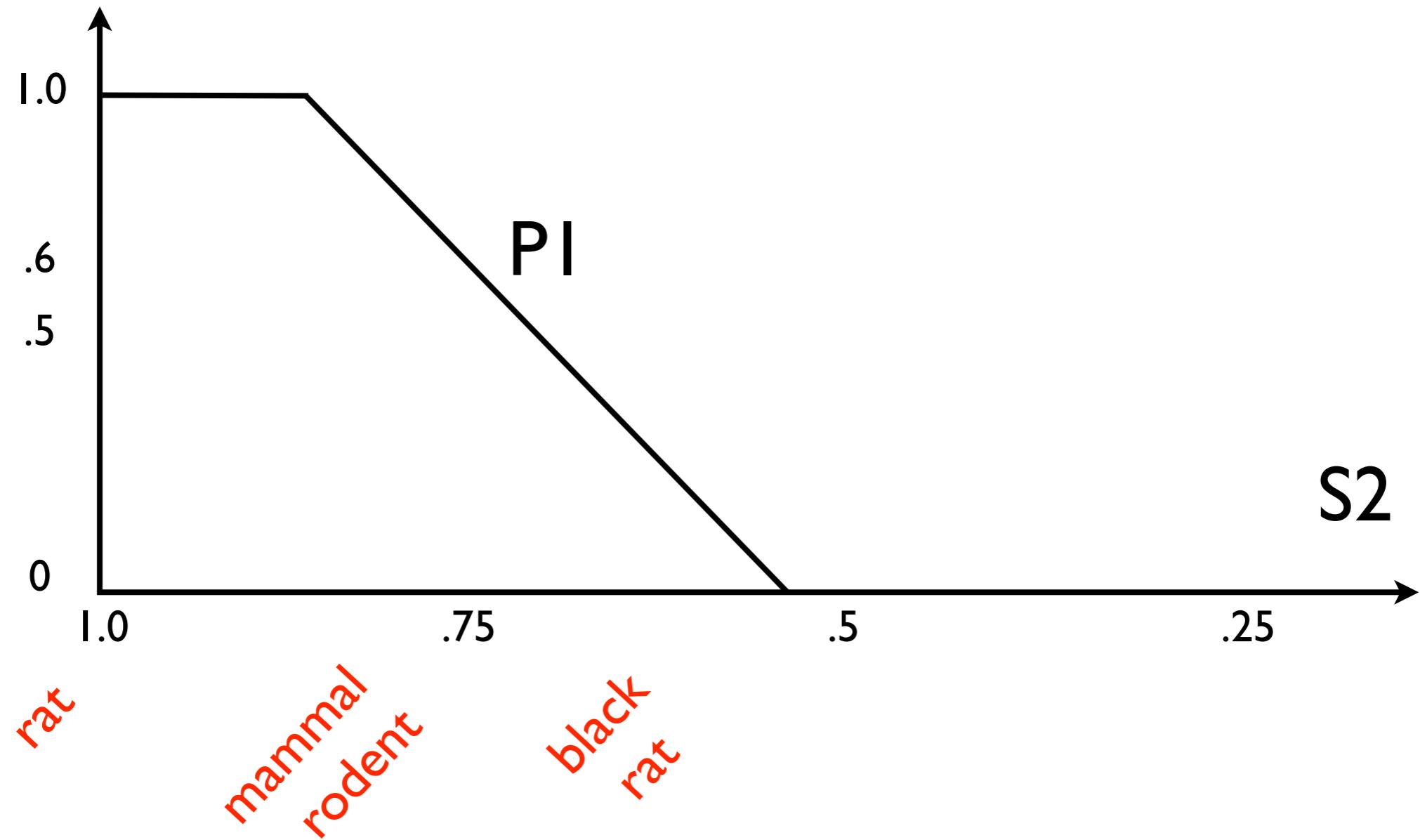
mammal
rodent

black
rat

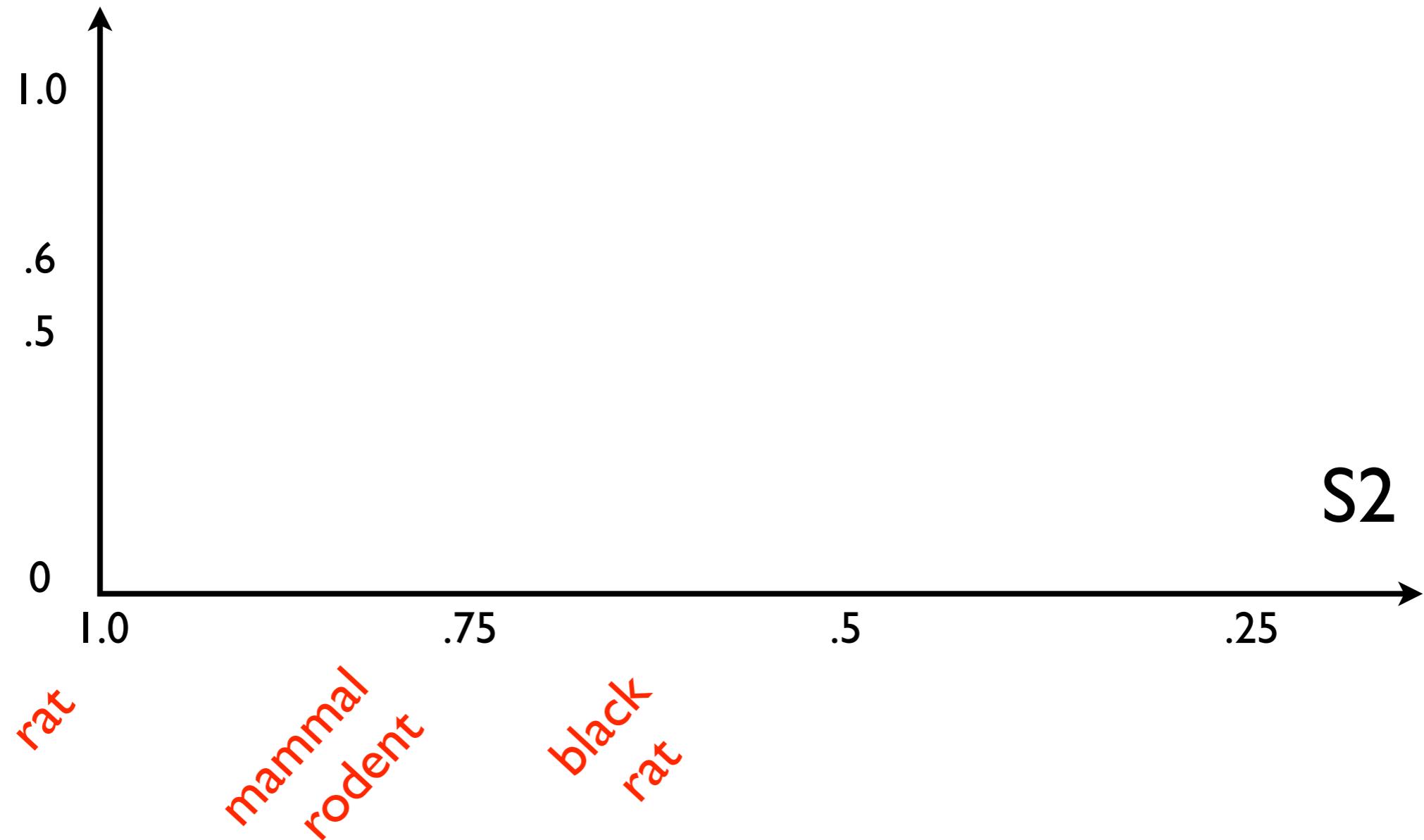
Context of Exp. 2



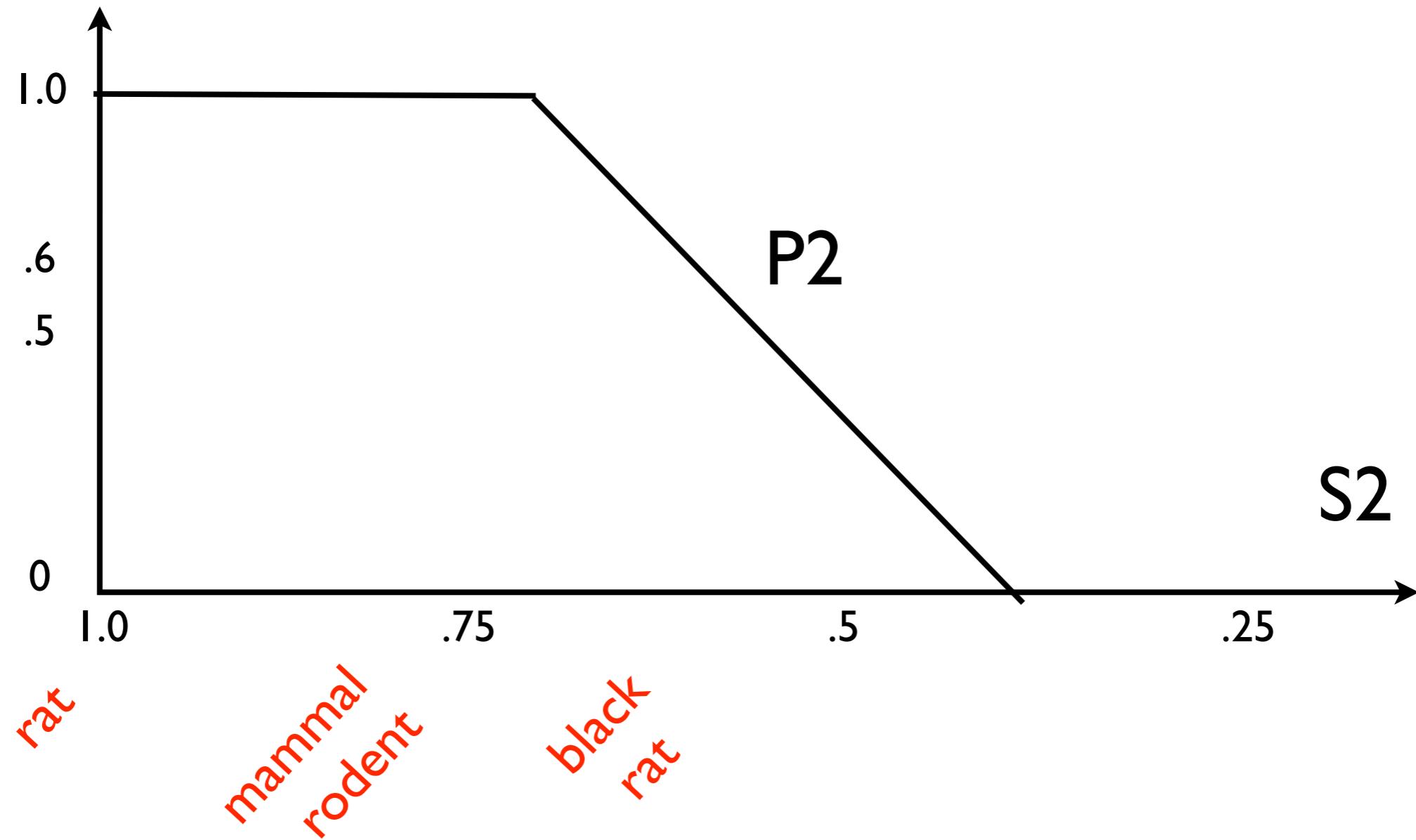
Context of Exp. 2



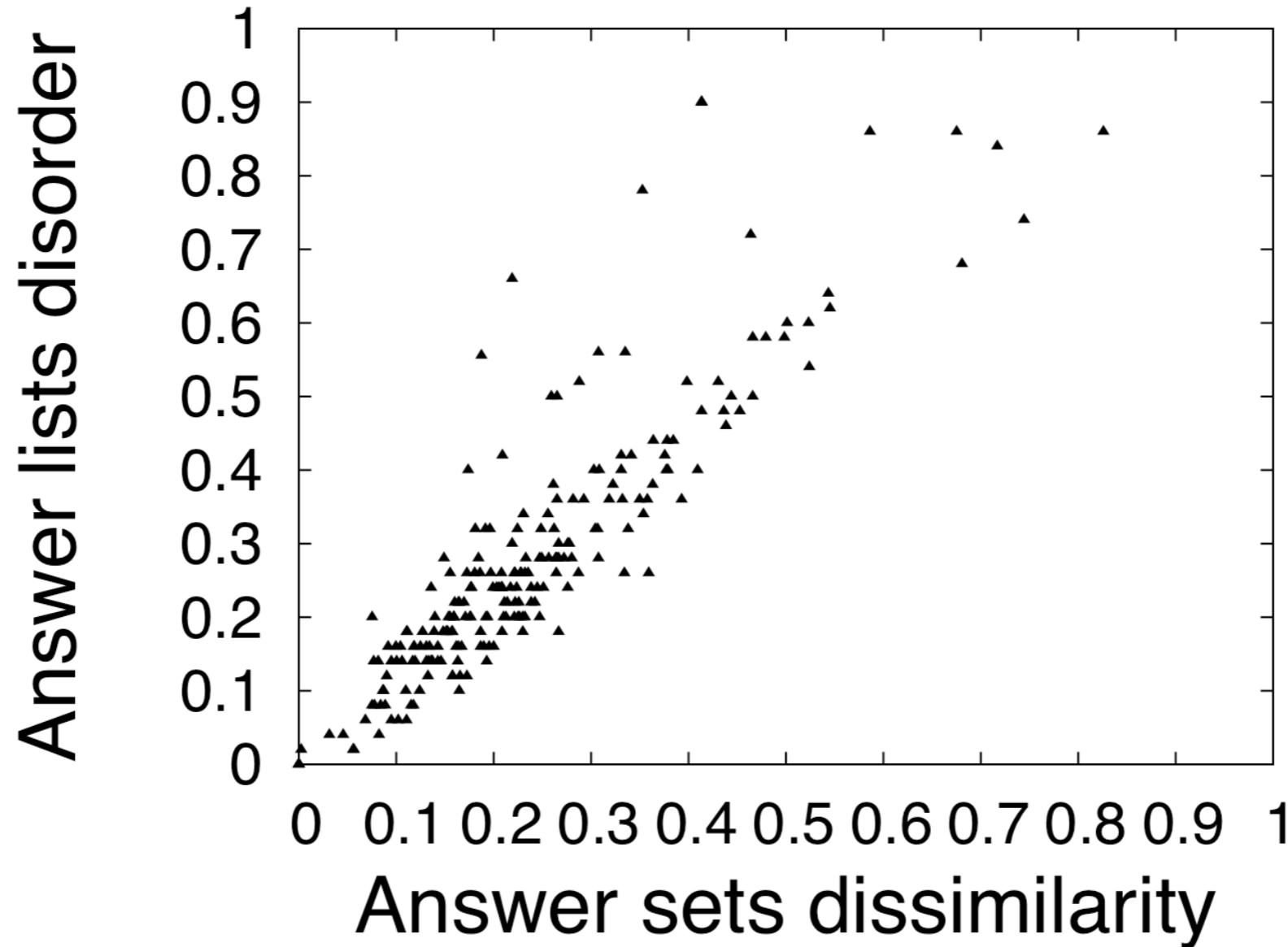
Context of Exp. 2



Context of Exp. 2



Results



(a)

Conclusion

- *No user's profile* at provider's side
- *Not intrusive* solution
- *New Description* of the query, not a new query language
- *Lightweight* solution



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