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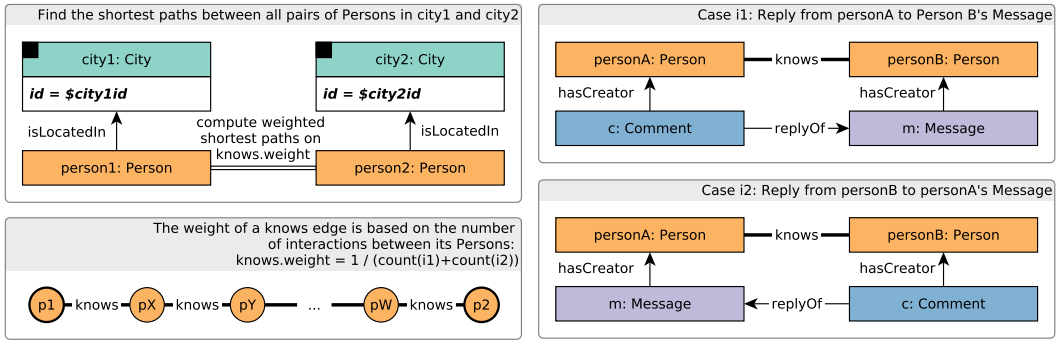
query	BI / read / 19
title	Interaction path between cities
pattern	
desc.	Given two Cities `city1`, `city2`, find Persons `person1`, `person2` living in these Cities (respectively) with the shortest *interaction path* between them. If there are multiple pairs of people with shortest paths having the same total weight, return all of them. The shortest path is computed using a weight between two Persons defined as the reciprocal of the number of interactions (direct reply Comments to a Message by the other Person). Therefore, more interactions imply a smaller weight. *Note:* Interactions are counted both ways, i.e. if Alice writes 2 reply Comments to Bob's Messages and Bob writes 3 reply Comments to Alice's Messages, their total number of interactions is 5.
params	1 `city1Id` ID — (A) Small Cities within the same Country with many direct relationships between their inhabitants (B) Small Cities from different Countries with only a few direct relationships between their inhabitants 2 `city2Id` ID
result	1 `person1.id` ID R 2 `person2.id` ID R 3 `totalWeight` 32-bit Float C
sort	1 `totalWeight` ↑ 2 `person1.id` ↑ 3 `person2.id` ↑
limit	20
CPs	3.3, 7.6, 7.7, 8.4, 8.6
relevance	Finding shortest paths between pairs of Persons in Cities can be implemented in theory with an *all-pairs shortest paths* algorithm. However, this needs to be executed on the whole Person-knows-Person graph (with edge weights derived from the number of interactions) so it is expected to be prohibitively expensive. A better approach is using multiple *single-source shortest path algorithms* (e.g. from the City with fewer inhibitants). Implementations can either pre-compute edge weights or compute them on-the-fly.