* Offset based negative sampling-OPENKE
  + Randomly replacing entities may make negative set contain some positive triples
  + This can weaken performance of KE model
* Different algorithms for negative sampling
  + Random Generation- used for functional predicates like capital which generates truly negative facts
  + LCWA- used for non-functional predicates
    - Local closed world assumption is that if there is exists a triple then the KB contains all occurrences for the two entities involved for that predicate
    - Semantically connected negative examples lead to better rules in the context of rule mining
  + ambiguous false facts
  + Issues with LCWA-
    - facts coming from related predicates
    - considering only 1 hop predicates between two entities
    - false facts should be from distinct predicates that are semantically close to the predicate p of true fact
  + Random Walk
    - Generation of candidate facts S(x) by using LCWA assumption
    - Check the type of entities involved with notion
    - Extract all possible paths with length smaller than threshold t between subject and object
    - For each path p in possible paths, initialize random walk from subject to each intermediate node that follows predicate p in the path.
* Homogeneity
  + Contains the capitals of world countries instead of just US and European cities
  + For a predicate p, this property can be controlled by clustering semantically the entities in the KB.