## Ontology alignment and debugging

***Describe the problem of ontology alignment.***

Ontology with overlapping information, with multiple ontologies, bottom-up creation of ontologies **important to know the inter-ontology relationships**

***Describe a framework for ontology alignment and explain the different components.***

Preprocessing – matcher – combination – filter – suggestions –

accepted or rejected – conflict checker – user

***Explain and give examples for different strategies for preprocessing/matching/combining/filtering.***

Preprocessing: selection of features, selection of search space.

Matching:

Based on linguistic matching: edit distance, N-gram

Structure-based strategies: similarity values, structure, nodes

Constraint-based strategies (bird flying animal), similarities between data types, based on cardinalities

Instance-based strategies: basic intuition. Intuition for structure-based extensions (documents about a concept are also about their super-concepts)

Use of auxiliarity: use of wordnet to find synonyms, use UMLS

Combining: usually weighted sum of similarity values of different matchers, maximum of similarity values of different matchers

Filtering:

threshold filtering: pairs of concepts with similarity higher or equal than threshold are alignment suggestions

Double threshold filtering: 1. Higher than or equal to upper threshold are alignment suggestions. 2. Pairs of concepts with similarity between lower and upper thresholds are alignment suggestions if they make sense with respect to the structure of the ontologies and the suggestions according to (1)

***Explain how to evaluate ontology alignment strategies / systems.***

Precision = correct mapping suggestions / mapping suggestions

Recall = correct mapping suggestions/ correct mappings

f-measure: combination of precision and recall

f = 2pr/(p+r)

***Understand performance of different approaches.***

***Know challenges for ontology alignment.***

Large-scale matching evaluation

Efficiency of matching techniques

Matching with background knowledge

Matcher selection, combination and tuning

User involvement (visualization, user feedback)

Explanation of matching results

Social and collaborative matching

Alignment management: infrastructure and support

***Explain and exemplify different kinds of defects in ontologies.***

Syntactic defects (wrong tags or incorrect format), Semantic defects (unsatisfied concepts, incoherent and inconsistent ontologies), modeling defects (wrong or missing relations)

***Give examples of the influence of defects in ontologies for semantically-enabled applications.***

***Describe a framework for ontology debugging and explain the different components.***

***Explain/compute MIPS and MUPS.***

***Explain the formulation of GTAP.***

***Expain the intuitions behind the preferences (semantically maximal, subset minimal, minmax, maxmin, skyline optimal) for GTAP solutions.***