### *Semantic web and ontologies*

***Describe the problems in the current web and the vision of the semantic web.***

A library of documents interconnected by links

A common portal to applications accessible through web pages, and presenting their results as web page.

A place where computers do the presentation easy and people do the linking and interpreting hard.

Locating information

Retrieving relevant information

Integrating information

***Show how semantic annotations based on ontologies would help solve the problems of the current web.***

Use on-line ontologies to specify meaning of annotations

1. Provide a vocabulary of terms
2. New terms can be formed by combining existing ones
3. Meaning of such terms is formally specified.

Ontologies define the basic terms and relations comprising the vocabulary of a topic area, as well as the rules for combining terms and relations to define extensions to the vocabulary.

GENE ONTOLOGY(GO)

***Explain what ontologies are used for.***

1. For communication between people and organizations
2. For enabling knowledge reuse and sharing
3. As basis for interoperability between system
4. As repository of information
5. As query model for information sources

Key technology for the Semantic Web

***Describe and explain the OBO Foundry principles.***

OBO – Open Biomedical Ontologies

1. Open and available
2. Common shared syntax
3. Unique identifier space
4. Procedures for identifying distinct successive versions
5. Clearly specified and clearly delineated content
6. Textual definitions for all terms
7. Use relations from OBO Relation Ontology
8. Well Document
9. Plurality of independent users
10. Developed collaboratively with other OBO Foundry members

***Explain and give examples of the components of ontologies.***

1. Concepts - represent a set or class of entities in a domain

Organized in taxonomies (fen lei)

1. Instances – often not represented in an ontology
2. Relations
3. Axioms (gong li) – facts that are always true

***Describe from a knowledge representation point of view the different kinds of ontologies.***

1. Controlled vocabularies (concepts)
2. Taxonomies (concepts, is-a)
3. Thesauri (ci ku) (concepts, predefined relations)
4. Data Models (e.g. EER, UML) (concepts, relations, axioms)
5. Logics (Concepts, relations, axioms)