
Distributed Information Systems: Spring Semester 2016
Quiz 2: Overview on Distributed Information Systems

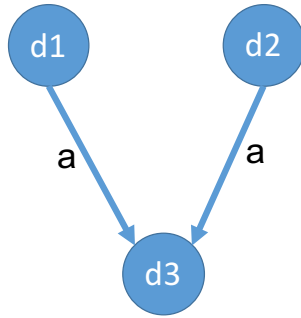
Student Name: _____ Date: 17 Mar 2016
Student ID: _____ Time: 11:15AM to 11:30AM

Total number of questions: 8
Each question has a single answer!

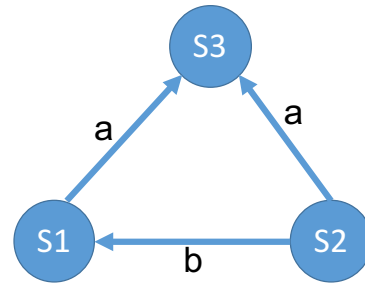
1. Which of the following statements about commonalities of XML and RDF is **not** correct?
 - ☐ a) Both XML and RDF documents can be interpreted as graphs.
 - ☐ b) Both XML and RDF have a schema language.
 - ☐ c) Both XML and RDF are suitable to encode relational data.
 - ☒ d) Both XML and RDF support classification and subclass relationships.
2. For which purpose is reification helpful?
 - ☒ a) It makes it possible to assign a type to a statement.
 - ☐ b) It makes it possible to assign a type to the subject of a statement.
 - ☐ c) It makes it possible to represent complex data types.
 - ☐ d) It makes it possible to make statements about anonymous resources.
3. Which is the correct expanded form of the following RDF statement:

 <MaritalStatus rdf:ID="Married"/>
 - ☐ a) <rdf:statement><rdf:MaritalStatus>Married</rdf:MaritalStatus></rdf:statement>
 - ☒ b) <rdf:statement id="Married"><rdf:type>MaritalStatus</rdf:type></rdf:statement>
 - ☐ c) <rdf:statement id="Married"><rdfs:class>MaritalStatus</rdfs:class></rdf:statement>
 - ☐ d) <MaritalStatus><rdf:subject>Married</rdf:subject></MaritalStatus>
4. Which of the following statements represents a subclass relationship expressed in first order logic language?
 - ☒ a) $\forall x (\text{herbivore}(x) \implies \text{animal}(x))$
 - ☐ b) <owl:Class rdf:ID="herbivore"><rdfs:subClassOf rdf:resource="#animal"/></owl:Class>
 - ☐ c) $\forall x (\text{carnivore}(x) \iff \forall y (\text{eats}(x,y) \implies \text{animal}(y)))$
 - ☐ d) $\text{herbivore} \subseteq \text{animal}$
5. Which of the following is **not** true about a Data Graph ?
 - ☐ a) The minimal number of edges is larger than $|V| - 1$ where $|V|$ is the number of vertices.
 - ☒ b) The maximal number of possible edges is $(|V|^2 - |V|)/2$ where $|V|$ is the number of vertices.
 - ☐ c) All nodes must be reachable from at least one root.
 - ☐ d) Only leaf nodes can store data values.
6. What is the cause that the classification of nodes in a data graph can be ambiguous?
 - ☐ a) The same data node can belong to multiple classes in the schema graph.
 - ☒ b) There exist several different simulation relationships that can result in different classifications of nodes.
 - ☐ c) It is not clear which graph is the data and the schema graph when the graphs are simulation equivalent.
 - ☐ d) There exist cases in which there is no uniquely defined maximal simulation.

7. Given the data graph and the schema graph shown below. Which of the following is true:



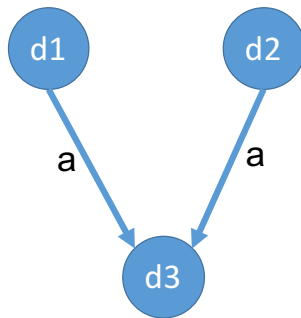
Data graph D



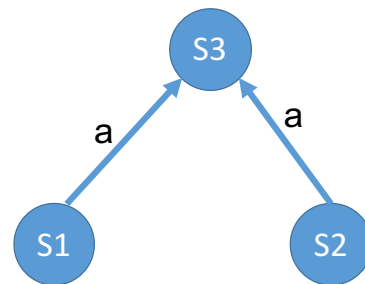
Schema graph S

- ☒ a) S simulates D. **But** D doesn't simulate S.
- ☐ b) D doesn't simulate S. **And** S doesn't simulate D.
- ☐ c) D simulates S. **But** S doesn't simulate D.
- ☐ d) S and D simulate each other.

8. Consider the new data graph and schema graph below. You know that S simulates D (i.e. $D < S$). To which class(es) would node d1 belong in the maximal simulation relationship.



Data graph D



Schema graph S

- ☐ a) Class S1 only
- ☐ b) Class S2 only
- ☐ c) Classes S1 and S3
- ☒ d) Classes S1 and S2