

Big Data Mangement - A.A. 2013/14
Written Exam of **February 20, 2014**

Exercise 1

Describe the following OLAP operators: roll-up, drill-down, and slice and dice. Examples that clarify the above notions are appreciated.

Exercise 2

Provide a DFM diagram formalizing the following requirements. A company managing various cinemas over several countries wants to construct a DW to analyze the sale of tickets, i.e., how many tickets are sold by the cinemas it manages. Each cinema is settled in a city, which belongs to a region, who in turn belongs to a country. Regions are also divided into areas, which are orthogonal to countries (i.e., an area can contain regions belonging to different countries). The company is interested in retrieving ticket sales per dates, months, quarters, and years. Also, it wants to obtain sales per days of the week (i.e., number of tickets sold on Mondays, Tuesdays, etc.). Finally, the company wants to know how many tickets are sold according to the genre of movies (i.e., how many for comedies, or for thrillers, or for horror movies, etc.).

Exercise 3

(a) Write an RDF/RDFS model (in any syntax you prefer, including a graph representation) expressing the following statements about URIs `Person`, `Man`, `Woman`, `isHausbandOf`, `hasName` `xsd:string`, `JJ`, `MM`, and literals `"John"` `^^xsd:string`, and `"Mary"` `^^xsd:string`

1. `Person`, `Man`, and `Woman` are classes;
2. `Man` is a subclass of `Person`;
3. `Woman` is a subclass of `Person`;
4. `isHausbandOf`, and `hasName` are properties;
5. the domain of `isHausbandOf` is `Man`;
6. the range of `isHausbandOf` is `Woman`;
7. the domain of `hasName` is `Person`;
8. the range of `hasName` is `xsd:string`;
9. `JJ` is a `Man`;
10. `MM` is a `Woman`;
11. `JJ` `hasName` `"John"`;
12. `MM` `hasName` `"Mary"`;
13. `JJ` `isHausbandOf` `MM`.

(b) Write a SPARQL query that returns the names of men that are husbands of a woman having name `"Mary"`.

Exercise 4

Describe (briefly) the main characteristics of aggregate data models, and explain the notion of aggregate within each such model.