

EASTER EXERCISES INF3580 SPRING 2011

Martin G. Skjæveland

05 April 2011

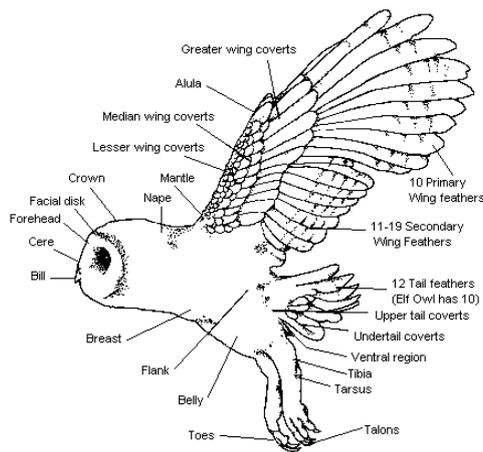


Figure 1: A bird.

0 Easter eggs

0.1 Logical puzzles

0.1.1 Exercise

According to Albert Einstein only 2 % of us are able to solve the Zebra Puzzle. Well, with a little help of OWL, it is not so difficult. Here it is:

1. There are five houses.
2. The Englishman lives in the red house.
3. The Spaniard owns the dog.
4. Coffee is drunk in the green house.
5. The Ukrainian drinks tea.
6. The green house is immediately to the right of the ivory house.
7. The Old Gold smoker owns snails.
8. Kools are smoked in the yellow house.
9. Milk is drunk in the middle house.

10. The Norwegian lives in the first house.
11. The man who smokes Chesterfields lives in the house next to the man with the fox.
12. Kools are smoked in a house next to the house where the horse is kept.
13. The Lucky Strike smoker drinks orange juice.
14. The Japanese smokes Parliaments.
15. The Norwegian lives next to the blue house.

Now, who drinks water? Who owns the zebra? In the interest of clarity, it must be added that each of the five houses is painted a different color, and their inhabitants are of different national extractions, own different pets, drink different beverages and smoke different brands of American cigarets [sic]. One other thing: in statement 6, right means your right.

The exercise is to encode the Zebra Puzzle in an ontology, so that the answer (Now, who drinks water? Who owns the zebra?) is computed by the reasoner.

Tip The perhaps most difficult to do in this exercise is to express all the implicit information in the puzzle, e.g., that there are five houses on a row, where some houses are next to each other and some are not, that there are exactly five persons and that each person has exactly one favorite drink, and that the five drinks mentioned are the only ones considered. Remember that OWL ontologies and reasoning abides by the open world assumption and also not the unique name assumption.

0.2 Sudoku

Use SPARQL to solve a game of Sudoku.

0.2.1 Exercise

This is the same exercise as 7.6 page 302 in Foundations of Semantic Web Technologies.

Consider a small game of sudoku 4x4, which has the following setup

| | | | | |
|---|--|--|--|---|
| | | | | 3 |
| | | | | 4 |
| 2 | | | | |
| 3 | | | | |

In (this game of) Sudoku the aim is to place the numbers 1–4 in the cells so that no number is duplicated for any row, any column or any of the four 2x2 squares that make up each corner of the game.

Create an RDF document and a SPARQL query that solves this game.

Tip Use FILTER to state that all values on a row are distinct. Repeat this process so that it reflects the rules of the game.