Assignment 2

Total marks: 85.

Out: November 3
Due: November 17 at the beginning of class

Note: Your report for this assignment should be the result of your own individual work. Take care to avoid plagiarism ("copying"). You may discuss the problems with other students, but do not take written notes during these discussions, and do not share your written solutions.

1. Exercise 3 of Chapter 6 in the textbook. [40 points]

2. Exercise 2 of Chapter 9 in the textbook. [20 points]

3. Exercise 4 of Chapter 9 in the textbook. For part (a), give your algorithm in English/pseudocode [10 points] and write and test a SWI Prolog program that implements it [10 points]. The main predicate should be called `difference(D1,D2,D3)` and should succeed when `D1` subsumes `D2`, binding `D3` to the difference between `D2` and `D1` (if `D1` does not subsume `D2`, it should fail). Represent concepts as lists in the obvious way. Note that computing the difference becomes easy if you first normalize `D1` and `D2`, as discussed in exercise 6 of chapter 9. Test your program on the following examples as well as your own:

```
D1 = [and p [and q u]]
D2 = [and [and q t] [and p s] u]

D1 = [and [all r1 p] [and [all r1 q] [all r1 u]]]
D2 = [and [all r1 [and q t]] [all r1 [and p s]] [all r1 u]]

D1 = [and [all r1 p] [all r2 p]
          [and [all r1 q] [all r2 q] [all r1 u]]]
D2 = [and [all r1 [and q t]] [all r2 p] [all r1 [and p s]]
          [all r1 u] [all r2 [and q s]]]

D1 = [and p [and q u]]
D2 = [and [and q t] [and p s] v]
```

Part (b) is worth [5 points].