

## Homework assignment for chapters 8 and 9 in Russell & Norvig

1. Modified from 8.7 on page 269: Represent the sentence “All Germans speak the same languages” in predicate calculus. Use  $Speaks(x,l)$ , meaning that person  $x$  speaks language  $l$ , and  $German(y)$ , meaning that  $y$  is a German person.
2. 8.8 on page 269: What axiom is needed to infer the fact  $Female(Laura)$  given the facts  $Male(Jim)$  and  $Spouse(Jim, Laura)$ ?
3. Modified from 8.10 on page 269: Rewrite the propositional wumpus world facts from Section 7.5 into first-order logic.
4. 9.4 on page 316: For each pair of atomic sentences, give the most general unifier if it exists:
  - a.  $P(A,B,B), P(x, y, z)$ .
  - b.  $Q(y, G(A, B)), Q(G(x, x), y)$ .
  - c.  $Older(Father(y), y), Older(Father(x), John)$ .
  - d.  $Knows(Father(y), y), Knows(x, x)$ .
5. 9.17 on page 318: How can resolution be used to show that a sentence is valid? Unsatisfiable?