Logics for Artificial Intelligence 2023-24

Homework 10/10 – Default Reasoning

To be delivered before the start of the next lecture on May 22nd, 2024

Complete the following two tasks:

Task 1 (5 points)

Consider the following knowledge:

John is a fireman and a cook.

Brave people are always reckless.

Cooks are never brave.

Sensitive people are never reckless.

Firemen are usually brave and not reckless.

Cooks are usually sensitive.

Brave people are usually not sensitive.

Model this knowledge in standard predicate logic, using three abnormality predicates (for Firemen, Cooks and Brave people). Using **circumscription**, what can you say about the recklessness and the sensitivity of John?

Task 2 (5 points)

Consider the following knowledge:

John is a fireman and a cook.

Brave people are always reckless.

Firemen are usually brave.

Cooks are usually not brave.

Brave people are usually not sensitive.

Firemen are usually not reckless.

Cooks are usually sensitive.

Model this knowledge in the **Default Logic** formalism, using 3 facts and 5 normal default rules. What would a credulous reasoner believe about the recklessness of John? And a skeptical reasoner?

Do these conclusions change if we receive later the additional information that John is not sensitive?