Exercise 4.1  Reconsider Example 3.23 from the lecture (slide 71). Explain why the defaults had to be turned into semi-normal defaults instead of putting the additional condition in the prerequisite of the defaults.

Exercise 4.2  Show that every process $\Pi$ of a normal default theory $T$ is included in a closed process $\Pi'$ of default theory $T$.

Hint: For infinite processes use the weaving technique from the proof of Theorem 3.21.

Exercise 4.3  Poole-type default theories$^1$ have the form $T = (W, D)$, where all defaults $\delta_i \in D$ have the form

$$\phi_i : (\beta \land \psi_i) \quad \psi_i$$

i.e., all defaults in $D$ have formula $\beta$ as a conjunct in the justification and the other conjunct as consequence.

Prove or refute the following claims:

(a) Poole-type default theories always have extensions.
(b) Poole-type default theories are semi-monotonic.
(c) Poole-type default theories have orthogonal extensions.

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$^1$Invented by David Poole.