Advanced Logics
Winter term 2015

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Exercise sheet 2

Exercise 1:

(a) Construct a **K**-model $\mathcal{M}$ with $w \in \mathcal{M}$ s.t. $\mathcal{M}, w \not\models (\Box p) \rightarrow (\Diamond p)$.

(b) Construct a **T**-model $\mathcal{M}$ with $w \in \mathcal{M}$ s.t. $\mathcal{M}, w \not\models (\Box p) \rightarrow (\Box\Box p)$.

(c) Construct a **D**-frame which is not a **T**-frame.

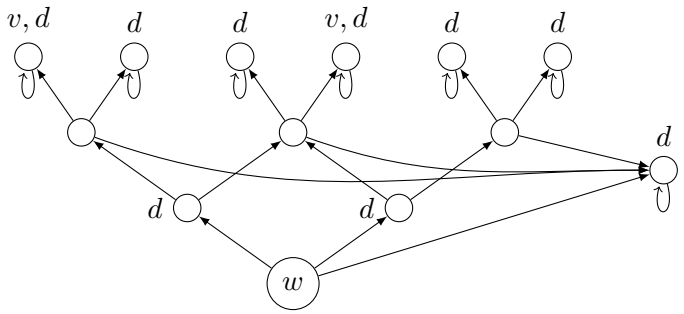
(d) Construct a **K**4-model $\mathcal{M}$ with $w \in \mathcal{M}$ s.t. $\mathcal{M}, w \not\models (\Box p) \rightarrow (\Box\Diamond p)$.

(e) Construct a **S**4-model $\mathcal{M}$ with $w \in \mathcal{M}$ s.t. $\mathcal{M}, w \not\models (\Diamond p) \rightarrow (\Box\Diamond p)$.

(f) Construct a **S**4-model $\mathcal{M}$ with $w \in \mathcal{M}$ s.t. $\mathcal{M}, w \not\models (\Diamond\Box p) \rightarrow p$.

(g) Construct a **S**5-model $\mathcal{M}$ with $w \in \mathcal{M}$ s.t. $\mathcal{M}, w \not\models (\Diamond p) \rightarrow (\Box p)$.

Exercise 2: Let $\mathcal{M}$ be the following model



and let $\phi = \Diamond\Box(\Diamond(d \oplus \Box(\Diamond(d \oplus v))))$. Extend the model checking algorithm from the lecture to operate also on the $\oplus$ operator and verify if $\mathcal{M}, w \models \phi$ holds.