

Logik TUT 5

Max Springenberg

February 7, 2017

5.1 Noch ein Erfuellbarkeitstest

5.1.1

NNF bilden:

$$\begin{aligned}\varphi &= \neg((\neg A \vee B) \rightarrow (C \vee \neg A)) \\ &\equiv \neg(\neg(\neg A \vee B) \vee (C \vee \neg A)) \\ &\equiv (\neg A \vee B) \wedge \neg(C \vee \neg A) \\ &\equiv (\neg A \vee B) \wedge \neg C \wedge A = \varphi'\end{aligned}$$

Tableaukalkuel:

$$\begin{array}{c} A \\ | \\ \neg C \\ | \\ (\neg A \vee B) \\ l, r \\ \\ l : \\ \neg A \\ \not\downarrow \\ \\ r : \\ B \\ \checkmark \end{array}$$

5.1.2

NNF bilden:

$$\begin{aligned}\varphi &= \neg((A \rightarrow B) \rightarrow B) \wedge A \\ &\equiv \neg(\neg(A \rightarrow B) \vee B) \wedge A \\ &\equiv \neg(\neg(\neg A \vee B) \vee B) \wedge A \\ &\equiv (\neg A \vee B) \wedge \neg B \wedge A = \varphi'\end{aligned}$$

Tableaukalkuel:

$$\begin{array}{c} A \\ | \\ \neg B \\ | \\ (\neg A \vee B) \\ l, r \\ \\ l : \\ \neg A \\ \not\downarrow \\ \\ r : \\ B \\ \not\downarrow \end{array}$$

5.1.3

NNF vorhanden

Tableaukalkuel:

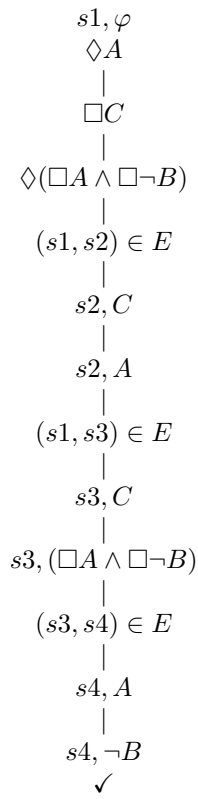
$$\begin{array}{l}
 s1, \varphi \\
 l, r \\
 l : s1, \Diamond(\Diamond A \wedge B) \\
 | \\
 (s1, s2) \in E \\
 | \\
 s2, (\Diamond A \wedge B) \\
 | \\
 s2, B \\
 | \\
 s2, \Diamond A \\
 | \\
 (s2, s3) \in E \\
 | \\
 s3, A \\
 \checkmark
 \end{array}$$

$$\begin{array}{l}
 r : s1, \Diamond B \\
 | \\
 (s1, s4) \in E \\
 | \\
 s4, B \\
 \checkmark
 \end{array}$$

5.1.4

NNF vorhanden

Tableaukalkuel:

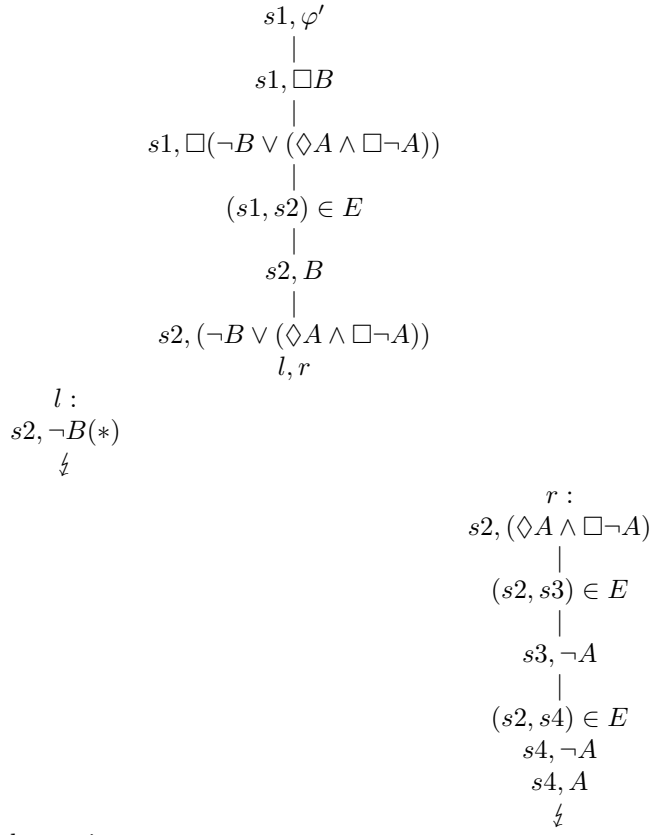


5.1.5

NNF bilden:

$$\begin{aligned}
\varphi &= \Box(B \rightarrow (\Diamond A \wedge \Box \neg A)) \wedge \Box B \\
&\equiv \Box(\neg B \vee (\Diamond A \wedge \Box \neg A)) \wedge \Box B = \varphi'
\end{aligned}$$

Tableaukalkuel:



alternativ:
 $\varphi' \equiv \Box(\neg B \vee (\Diamond A \wedge \neg \Diamond A)) \wedge \Box B$
 $\equiv \Box(\neg B \vee \perp) \wedge \Box B$
 $\equiv \Box \neg B \wedge \Box B$
 $\equiv \perp$

5.2 Anwendung des Erfuellbarkeitstest