-NoValue-

syn.1 Semantic Notions

mvl:syn:sem:sec Suppose a many-valued logic **L** is given by a matrix. Then we can define the usual semantic notions for **L**.

Definição syn.1. 1. A fórmula φ is *satisfiable* if for some $\mathfrak{v}$, $\mathfrak{v} \vDash \varphi$; it is *unsatisfiable* if for no $\mathfrak{v}$, $\mathfrak{v} \vDash \varphi$;

2. A fórmula φ is a *tautology* if $\mathfrak{v} \vDash \varphi$ for all valorações v;

3. If Γ is a set of fórmulas, $\Gamma \vDash \varphi$ ("Γ entails φ") if and only if $\mathfrak{v} \vDash \varphi$ for every valoração $\mathfrak{v}$ for which $\mathfrak{v} \vDash \Gamma$.

4. If Γ is a set of fórmulas, Γ is *satisfiable* if there is a valoração $\mathfrak{v}$ for which $\mathfrak{v} \vDash \Gamma$, and Γ is *unsatisfiable* otherwise.

We have some of the same facts for these notions as we do for the case of classical logic:

mvl:syn:sem:prop:semanticalfacts **Proposição syn.2.**

1. *φ is a tautology if and only if $\emptyset \vDash \varphi$;*

2. *If Γ is satisfiable then every finite subset of Γ is also satisfiable;*

mvl:syn:sem:def:monotonicity 3. *Monotonicity: if $\Gamma \subseteq \Delta$ and $\Gamma \vDash \varphi$ then also $\Delta \vDash \varphi$;*

mvl:syn:sem:def:Cut 4. *Transitivity: if $\Gamma \vDash \varphi$ and $\Delta \cup \{\varphi\} \vDash \psi$ then $\Gamma \cup \Delta \vDash \psi$;*

Prova. Exercise. □

Problema syn.1. Prove Proposição syn.2

In classical logic we can connect entailment and the conditional. For instance, we have the validity of *modus ponens*: If $\Gamma \vDash \varphi$ and $\Gamma \vDash \varphi \rightarrow \psi$ then $\Gamma \vDash \psi$. Another important relationship between $\vDash$ and $\rightarrow$ in classical logic is the semantic deduction theorem: $\Gamma \vDash \varphi \rightarrow \psi$ if and only if $\Gamma \cup \{\varphi\} \vDash \psi$. These results *do not* always hold in many-valued logics. Whether they do depends on the truth function $\widetilde{\rightarrow}$.

Créditos das Imagens

Referências Bibliográficas