

Predikatni račun

$$\forall \quad \exists x$$

Množice / tipi $A \quad B \quad C$

Elementi $x \in A, y \in B$ / $x: A \quad y: B$

Predikati in relacije:

- predikat na A je $P \subseteq A$, pišemo $x \in P$
- predikat na A je $P: A \rightarrow \{\perp, \top\}$, pišemo $P(x)$
- relacija $R \subseteq A \times B$ pišemo $(x, y) \in R$
 $R: A \times B \rightarrow \{\perp, \top\}$ pišemo $R(x, y)$

Coq: predikat $P: A \rightarrow \text{Prop}$, pišemo $P \ x$ ali $P(x)$
 relacija $R: A * B \rightarrow \text{Prop}$, pišemo $R(x, y)$
 $R: A \rightarrow B \rightarrow \text{Prop}$
 $A \rightarrow (B \rightarrow \text{Prop})$ pišemo $R \ x \ y$

Pravila sklepanja

Univerzalni kvantifikator

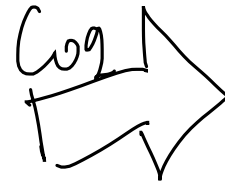
$$\underbrace{x:\mathbb{R}, f:\mathbb{R}\rightarrow\mathbb{R}}_{\text{kontekst}} \quad f(x) = f(-x)$$

kontekst

$$n(g) = n(-g)$$

$$\underbrace{x_1:A_1, x_2:A_2, \dots, x_n:A_n}_{\Gamma} \quad \underbrace{P_1, \dots, P_n}_{\Delta} \vdash Q$$

$$\begin{array}{l} x_1:A_1 \\ x_2:A_2 \\ \vdots \\ x_n:A_n \\ H_1:P_1 \\ \vdots \\ H_n:P_n \\ \hline Q \end{array}$$



$$\Gamma \mid \Delta \vdash Q$$

če imamo te
spremenljivke

če veljajo
te hipoteze

potem velja ta izjava Q

Univerzalni in eksistenčni kvantifiktor

$$\frac{\Gamma, x:A \mid \Delta \vdash P(x)}{\Gamma \mid \Delta \vdash \forall x:A, P(x)} \quad \text{I}\forall \text{ intro}$$

$$\frac{\Gamma \mid \Delta \vdash \forall x:A, P(x) \quad \Gamma \mid \Delta \vdash a:A}{\Gamma \mid \Delta \vdash P(a)} \quad \text{E apply}$$

spremenljivke

izraz

$$\frac{\Gamma \mid \Delta \vdash a:A \quad \Gamma \mid \Delta \vdash P(a)}{\Gamma \mid \Delta \vdash \exists x:A, P(x)} \quad \text{I}\exists \text{ exist}$$

izraz

$$\frac{\Gamma \mid \Delta \vdash \exists x:A, P(x) \quad \Gamma, x:A \mid \Delta, P(x) \vdash Q}{\Gamma \mid \Delta \vdash Q} \quad \text{destruct}$$