2-AIN-108 Výpočtová logika: Prvorádová logika

Gentleman punishes or kills everyone who insults a lady.

$$(\forall z)(lady(z) \to (\forall y)(insult(y, z) \to$$
$$(\exists x)(gentleman(x) \land (punish(x, y) \lor kill(x, y)))))$$

Whoever insults a lady, is rude.

$$(\forall z)(lady(z) \to (\forall y)(insult(y, z) \to rude(y)))$$

Gentleman kills only enemies who attack him.

$$(\forall x)(gentleman(x) \to (\forall y)(kill(x, y) \to$$
$$(enemy(y, x) \land attack(y, x))))$$

Gentleman kills all enemies who attack him.

$$(\forall x)(gentleman(x) \to (\forall y)((enemy(y, x) \land attack(y, x)) \to$$
$$kill(x, y)))$$

Rude people are gentleman's enemies.

$$(\forall x)(gentleman(x) \to (\forall y)(rude(y) \to enemy(y, x)))$$

Peggy Sue is a lady.
$$lady(PeggySue)$$

Billy Boy insulted Peggy Sue.

$$insult(BillyBoy, PeggySue)$$

Jackie is a gentleman.

$$gentleman(Jackie)$$

Billy Boy attacked Jackie.

$$attack(BillyBoy, Jackie)$$

1 Odvodzovanie

1. Dokážte v Hilbertovom kalkule

$$kill(Jack, John) \tag{T1}$$
$$(\forall x)((\exists y)kill(x, y) \to murderer(x)) \tag{T2}$$
$$(\forall x)(murderer(x) \to jail(x)) \tag{T3}$$

2. Uvažujme teóriu T z úvodu cvičenia. Pomocou rezolvencie zistite, či $T \models \phi$ ak

   (a) $\phi = kill(Jackie, BillyBoy)$

   (b) $\phi = punish(Jackie, BillyBoy)$