Programske paradigme - primer rezolucije

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25. 3. 2020.

Date su nam rečenice:
Nobody who really appreciates Beethoven fails to keep silence while the Moonlight sonata is being played.
Guinea pigs are hopelessly ignorant of music.
No one who is hopelessly ignorant of music ever keeps silence while the Moonlight sonata is being played.
Therefore, guinea pigs never really appreciate Beethoven.

Uvedimo formule:
$Beethoven(x)$ - x appreciates Beethoven
$Silent(x)$ - x is silent (keeps silence) while the Moonlight sonata is being played
$GuineaPig(x)$ - x is a guinea pig
$Ignorant(x)$ - x is hopelessly ignorant of music

Prevedimo date rečenice koristeći ove formule:
$\forall x(Beethoven(x) \Rightarrow Silent(x))$
$\forall x(GuineaPig(x) \Rightarrow Ignorant(x))$
$\forall x(Ignorant(x) \Rightarrow \neg Silent(x))$

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$\forall x(GuineaPig(x) \Rightarrow \neg Beethoven(x))$

Prebacivanjem implikacija u KNF dobijamo:
$\forall x(\neg Beethoven(x) \vee Silent(x))$
$\forall x(\neg GuineaPig(x) \vee Ignorant(x))$
$\forall x(\neg Ignorant(x) \vee \neg Silent(x))$

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$\forall x(\neg GuineaPig(x) \vee \neg Beethoven(x))$

Negirajmo zaključak:
$\neg\forall x(\neg GuineaPig(x) \vee \neg Beethoven(x))$
$\equiv \exists x(GuineaPig(x) \wedge Beethoven(x))$
Dakle, negacija zaključka važi za neku konstantu a, odnosno važe formule $GuineaPig(a)$
i $Beethoven(a)$ (u dokazu koraci 4 i 5).

Primenimo metod rezolucije:
1. $\neg Beethoven(x) \vee Silent(x)$ (premisa)
2. $\neg GuineaPig(x) \vee Ignorant(x)$ (premisa)
3. $\neg Ignorant(x) \vee \neg Silent(x)$ (premisa)
4. $GuineaPig(a)$ (negacija zaključka; prvi konjunkt)
5. $Beethoven(a)$ (negacija zaključka; drugi konjunkt)
6. $\neg Beethoven(x) \vee \neg Ignorant(x)$ (rezolucija, 1, 3)
7. $\neg GuineaPig(x) \vee \neg Beethoven(x)$ (rezolucija, 2, 6)
8. $\neg Beethoven(a)$ (unifikacija $\sigma[x \to a]$, 4, 7)
9. $\perp$ (rezolucija, 5, 8)
10. QED