

FORMÁLNE METÓDY TVORBY SOFTVÉRU

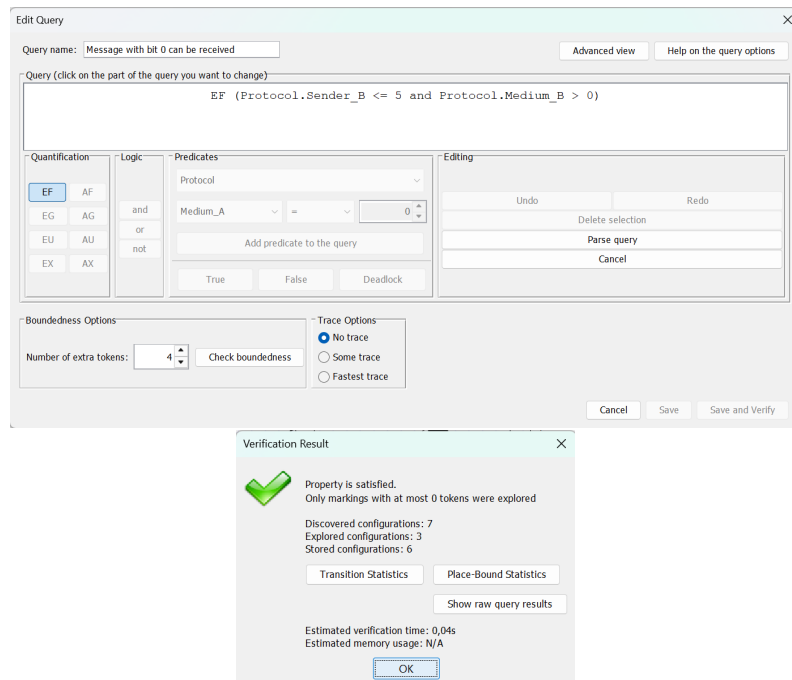
DOMÁCA ÚLOHA 8

Autor: Marián Kravec

1.)

Sender_A najkôr pošle správu akciou Send_0 s bitom nula a prejde do stavov Sender_B a Medium_A, Sender_B následne čaká až 5 časových jednotiek, či nedostane sa nie je možné spraviť akciu Ack_rec_0, medzitým Medium_A môže správu stratiť alebo aktivovať Receiver_B ktorý posielá správu do Receiver_C ktorého úlohou je hlavne pri novej správe s opačným bitom správy kontrolovať, že predchádzajúca správa bola prijatá... v podstate, a do Medium_B ktorý buď správu stratí alebo spolu so Sender_B aktivuje Sender_C a celý proces začína na novo s opačným bitom.

Skúmané vlastnosti:



Obr. 1: Správa 0 vie byť úspešne prijatá

Edit Query

Query name: Advanced view Help on the query options

Query (click on the part of the query you want to change)

AF ! (deadlock)

Quantification	Logic	Predicates	Editing
<input type="button" value="EF"/> <input checked="" type="button" value="AF"/> <input type="button" value="EG"/> <input type="button" value="AG"/> <input type="button" value="EU"/> <input type="button" value="AU"/> <input type="button" value="EX"/> <input type="button" value="AX"/>	<input type="button" value="and"/> <input type="button" value="or"/> <input type="button" value="not"/>	<input type="text" value="Protocol"/> <input type="text" value="Medium_A"/> <input type="text" value="="/> <input type="text" value="0"/> <input type="button" value="Add predicate to the query"/> <input type="button" value="True"/> <input type="button" value="False"/> <input type="button" value="Deadlock"/>	<input type="button" value="Undo"/> <input type="button" value="Redo"/> <input type="button" value="Delete selection"/> <input type="button" value="Reset query"/> <input type="button" value="Edit query"/>

Boundedness Options

Number of extra tokens:

Trace Options


☒ No trace

☐ Some trace

☐ Fastest trace

Cancel Save Save and Verify

Verification Result

 Property is satisfied.
Only markings with at most 0 tokens were explored

Discovered configurations: 0
Explored configurations: 0
Stored configurations: 0

Transition Statistics Place-Bound Statistics

Show raw query results

Estimated verification time: 0,05s
Estimated memory usage: N/A
The verification answer is guaranteed for the discrete semantics only (integer delays).

OK

Obr. 2: Nikdy nenastane deadlock

Edit Query

Query name: Advanced view Help on the query options

Query (click on the part of the query you want to change)

EF Protocol.Medium_A >= 8

Quantification	Logic	Predicates	Editing
<input checked="" type="button" value="EF"/> <input type="button" value="AF"/> <input type="button" value="EG"/> <input type="button" value="AG"/> <input type="button" value="EU"/> <input type="button" value="AU"/> <input type="button" value="EX"/> <input type="button" value="AX"/>	<input type="button" value="and"/> <input type="button" value="or"/> <input type="button" value="not"/>	<input type="text" value="Protocol"/> <input type="text" value="Medium_A"/> <input type="text" value="="/> <input type="text" value="0"/> <input type="button" value="Add predicate to the query"/> <input type="button" value="True"/> <input type="button" value="False"/> <input type="button" value="Deadlock"/>	<input type="button" value="Undo"/> <input type="button" value="Redo"/> <input type="button" value="Delete selection"/> <input type="button" value="Reset query"/> <input type="button" value="Edit query"/>

Boundedness Options

Number of extra tokens:

Trace Options


☒ No trace

☐ Some trace

☐ Fastest trace

Cancel Save Save and Verify

Verification Result

 Property is satisfied.
Only markings with at most 0 tokens were explored

Discovered configurations: 119
Explored configurations: 43
Stored configurations: 82

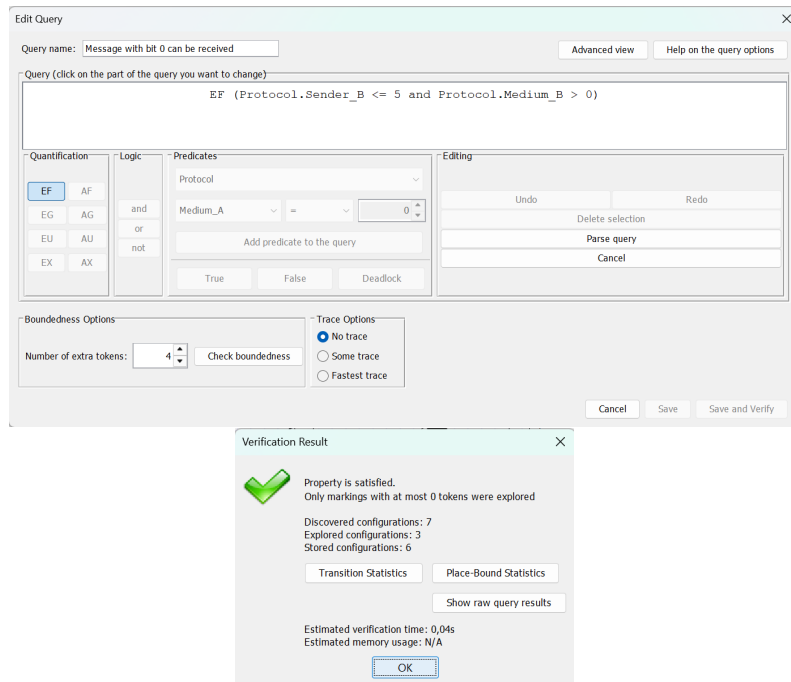
Transition Statistics Place-Bound Statistics

Show raw query results

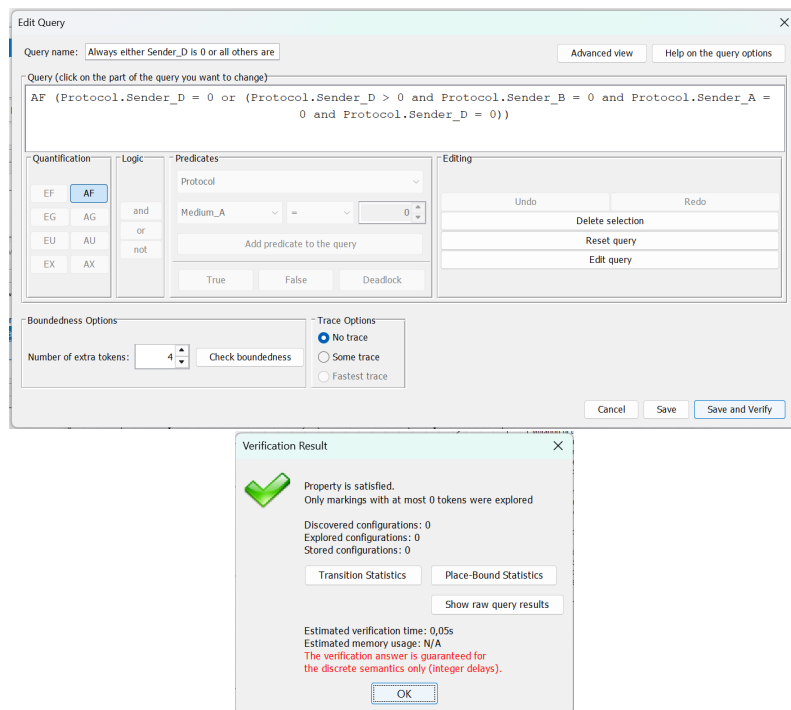
Estimated verification time: 0,04s
Estimated memory usage: N/A

OK

Obr. 3: Medium vie držať správu dlhý čas predtým než ju stratí



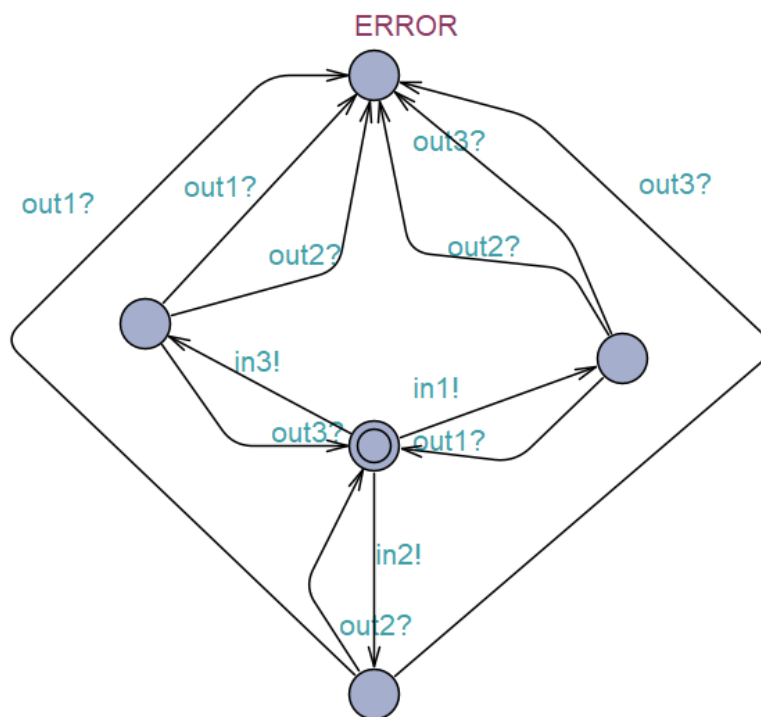
Obr. 4: Správa 0 vie byť úspešne prijatá



Obr. 5: Vždy ak Sender_D je nenulový všetci ostatní Senderi sú nulový

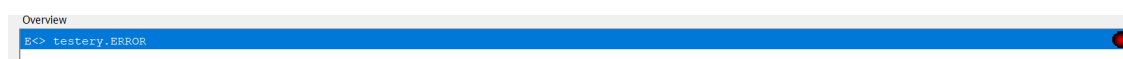
2.)

Do modelu pridáme tester:



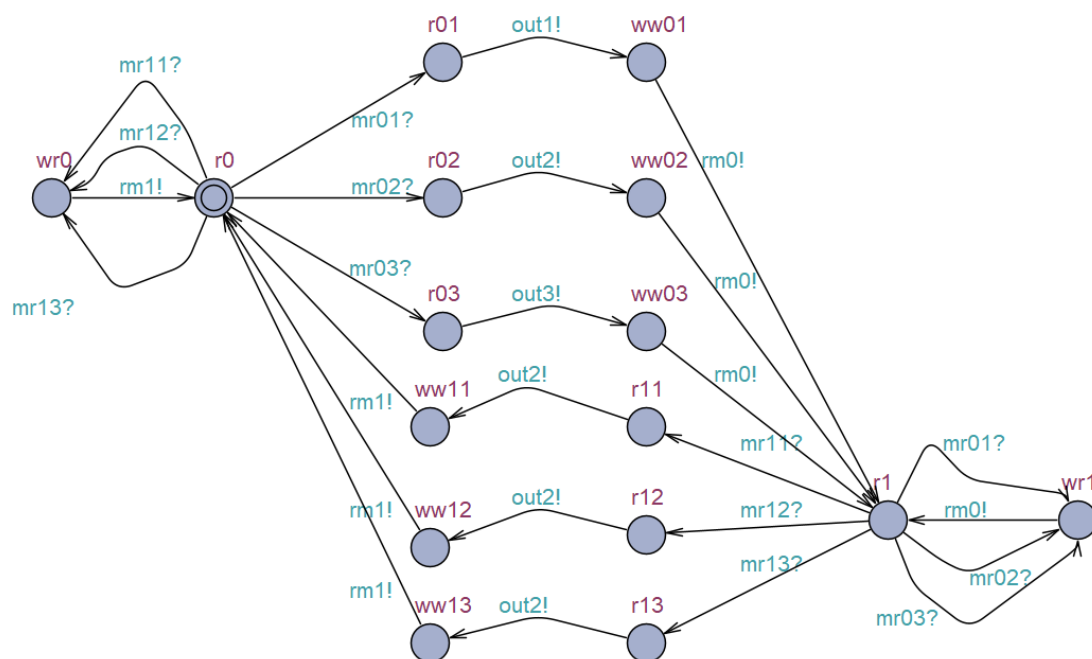
Obr. 6: Tester

Súčasná verzia nevie dosiahnuť ERROR, čo je dobré.



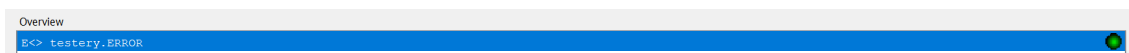
Obr. 7: Dosiahnutie Erroru v pôvodnej verzii

Pokazíme receiver tak, že pri bite 1 vždy pošle správu 2.



Obr. 8: Modifikovaný receiver

Teraz je už ERROR dosiahnuteľný.



Obr. 9: Dosiahnutie Erroru v modifikovanej verzii