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This form is a summary description of the model entitled "DBSingleClientW" proposed for the Model Checking Contest @ Petri Nets. Models can be given in several instances parameterized by scaling parameters. Colored nets can be accompanied by one or many equivalent, unfolded P/T nets. Models are given together with property files (possibly, one per model instance) giving a set of properties to be checked on the model.

Description

The model comes from a suite of 50 examples that come from the analysis of Erlang programs [1]. They were generated in [2] using an Erlang verification tool called Soter, using the example programs found on Soter's website [3].

The source model has an initial marking ($l_0 \geq 1$) constraint rather than a single initial marking, this is used in the MCC to scale the model up. The depth parameter corresponds to the unrolling depth used for loops.

Models found in [4] where converted to PNML thanks to an ITS-Tools [5] library.

References

1. Emanuele D'Osualdo and Jonathan Kochems and C.-H. Luke Ong. Automatic verification of erlang-style concurrency. CoRR, abs/1303.2201, 2013
2. J. Esparza, R. Ledesma-Garza, R. Majumdar, P. J. Meyer, and F. Niksic. An smt-based approach to coverability analysis. In CAV, volume 8559 of Lecture Notes in Computer Science, pages 603–619. Springer, 2014
3. SOTER 0.1 web interface http://mjolnir.cs.ox.ac.uk/soter/
4. Klara J. Meyer, Petrinizer repository, https://github.com/meyerphi/petrinizer.
5. Y. Thierry-Mieg, Homepage of ITS-tools https://lip6.github.io/ITSTools-web/

Scaling parameter

Parameter name	Parameter description	Chosen parameter values
D, M	D is the depth of the instance and M the number of initial tokens in place **l0**	(0, 4), (0, 5), (0, 6), (0, 7), (0, 8), (0, 9), (0, 10), (1, 4), (1, 5), (1, 6), (1, 7), (1, 8), (1, 9), (1, 10), (2, 4), (2, 5), (2, 6), (2, 7), (2, 8), (2, 9), (2, 10)

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Size of the model

Parameter	Number of places	Number of transitions	Number of arcs
D=0, M=4)	553	150	600
D=0, M=5)	553	150	600
D=0, M=6)	553	150	600
D=0, M=7)	553	150	600
D=0, M=8)	553	150	600
D=0, M=9)	553	150	600
D=0, M=10)	553	150	600
D=1, M=4)	1440	672	2688
D=1, M=5)	1440	672	2688
D=1, M=6)	1440	672	2688
D=1, M=7)	1440	672	2688
D=1, M=8)	1440	672	2688
D=1, M=9)	1440	672	2688
D=1, M=10)	1440	672	2688
D=2, M=4)	4763	2478	9912
D=2, M=5)	4763	2478	9912
D=2, M=6)	4763	2478	9912
D=2, M=7)	4763	2478	9912
D=2, M=8)	4763	2478	9912
D=2, M=9)	4763	2478	9912
D=2, M=10)	4763	2478	9912

Structural properties

ordinary — *all arcs have multiplicity one* ..... ✔
simple free choice — *all transitions sharing a common input place have no other input place* ..... ✗ [a]
extended free choice — *all transitions sharing a common input place have the same input places* ..... ✗ [b]
state machine — *every transition has exactly one input place and exactly one output place* ..... ✗ [c]
marked graph — *every place has exactly one input transition and exactly one output transition* ..... ✗ [d]
connected — *there is an undirected path between every two nodes (places or transitions)* ..... ✗ [e]
strongly connected — *there is a directed path between every two nodes (places or transitions)* ..... ✗ [f]
source place(s) — *one or more places have no input transitions* ..... ✔ [g]
sink place(s) — *one or more places have no output transitions* ..... ✔ [h]
source transition(s) — *one or more transitions have no input places* ..... ✗ [i]
sink transitions(s) — *one or more transitions have no output places* ..... ✗ [j]
loop-free — *no transition has an input place that is also an output place* ..... ✗ [k]
conservative — *for each transition, the number of input arcs equals the number of output arcs* ..... ✔ [l]
subconservative — *for each transition, the number of input arcs equals or exceeds the number of output arcs* ..... ✔ [m]
nested units — *places are structured into hierarchically nested sequential units* [n] ..... ✗

[a] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[b] transitions "t1" and "t2" share a common input place "s1", but only the former transition has input place "l0".
[c] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[d] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[e] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[f] the net is not connected and, thus, not strongly connected.
[g] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[h] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[i] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[j] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[k] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[l] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[m] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[n] the definition of Nested-Unit Petri Nets (NUPN) is available from http://mcc.lip6.fr/nupn.php

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Behavioural properties

safe — *in every reachable marking, there is no more than one token on a place* ..... ✗ [o]
dead place(s) — *one or more places have no token in any reachable marking* ..... ✔ [p]
dead transition(s) — *one or more transitions cannot fire from any reachable marking* ..... ?
deadlock — *there exists a reachable marking from which no transition can be fired* ..... ?
reversible — *from every reachable marking, there is a transition path going back to the initial marking* ..... ?
live — *for every transition t, from every reachable marking, one can reach a marking in which t can fire* ..... ?

Size of the marking graphs

Parameter	Number of reachable markings	Number of transition firings	Max. number of tokens per place	Max. number of tokens per marking
D=0, M=4)	?	?	?	5 [q]
D=0, M=5)	?	?	?	6 [r]
D=0, M=6)	?	?	?	7 [s]
D=0, M=7)	?	?	?	8 [t]
D=0, M=8)	?	?	?	9 [u]
D=0, M=9)	?	?	?	10 [v]
D=0, M=10)	?	?	?	11 [w]
D=1, M=4)	?	?	?	5 [x]
D=1, M=5)	?	?	?	6 [y]
D=1, M=6)	?	?	?	7 [z]
D=1, M=7)	?	?	?	8 [aa]
D=1, M=8)	?	?	?	9 [ab]
D=1, M=9)	?	?	?	10 [ac]
D=1, M=10)	?	?	?	11 [ad]
D=2, M=4)	?	?	?	5 [ae]
D=2, M=5)	?	?	?	6 [af]
D=2, M=6)	?	?	?	7 [ag]
D=2, M=7)	?	?	?	8 [ah]
D=2, M=8)	?	?	?	9 [ai]
D=2, M=9)	?	?	?	10 [aj]
D=2, M=10)	?	?	?	11 [ak]

[o] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[p] stated by CÆSAR.BDD version 3.7 on all 21 instances (3 values of D × 7 values of M).
[q] number of initial tokens, because the net is conservative.
[r] number of initial tokens, because the net is conservative.
[s] number of initial tokens, because the net is conservative.
[t] number of initial tokens, because the net is conservative.
[u] number of initial tokens, because the net is conservative.
[v] number of initial tokens, because the net is conservative.
[w] number of initial tokens, because the net is conservative.
[x] number of initial tokens, because the net is conservative.
[y] number of initial tokens, because the net is conservative.
[z] number of initial tokens, because the net is conservative.
[aa] number of initial tokens, because the net is conservative.
[ab] number of initial tokens, because the net is conservative.
[ac] number of initial tokens, because the net is conservative.
[ad] number of initial tokens, because the net is conservative.
[ae] number of initial tokens, because the net is conservative.
[af] number of initial tokens, because the net is conservative.
[ag] number of initial tokens, because the net is conservative.
[ah] number of initial tokens, because the net is conservative.
[ai] number of initial tokens, because the net is conservative.
[aj] number of initial tokens, because the net is conservative.
[ak] number of initial tokens, because the net is conservative.