



## Structural properties

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

## Behavioural properties

<b>safe</b> — in every reachable marking, there is no more than one token on a place .....	✓
<b>dead place(s)</b> — one or more places have no token in any reachable marking .....	? (a)
<b>dead transition(s)</b> — one or more transitions cannot fire from any reachable marking .....	? (b)
<b>deadlock</b> — there exists a reachable marking from which no transition can be fired .....	✓ (c)
<b>reversible</b> — from every reachable marking, there is a transition path going back to the initial marking .....	✗ (d)
<b>live</b> — for every transition $t$ , from every reachable marking, one can reach a marking in which $t$ can fire .....	? (e)

## 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
$N = 2$	11 <sup>(s)</sup>	14 <sup>(t)</sup>	?	?
$N = 3$	383 <sup>(u)</sup>	559 <sup>(v)</sup>	?	?
$N = 4$	? <sup>(w)</sup>	340 193 <sup>(x)</sup>	?	?

(a) stated by [CÆSAR.BDD](#) version 2.6 on all 4 instances (2, 3, 4, and 5).  
 (b) stated by [CÆSAR.BDD](#) version 2.6 on all 4 instances (2, 3, 4, and 5).  
 (c) stated by [CÆSAR.BDD](#) version 2.6 on all 4 instances (2, 3, 4, and 5).  
 (d) stated by [CÆSAR.BDD](#) version 2.6 on all 4 instances (2, 3, 4, and 5).  
 (e) stated by [CÆSAR.BDD](#) version 2.6 on all 4 instances (2, 3, 4, and 5).  
 (f) stated by [CÆSAR.BDD](#) version 2.6 to be true on 3 instance(s) out of 4, and false on the remaining 1 instance(s).  
 (g) stated by [CÆSAR.BDD](#) version 2.6 on all 4 instances (2, 3, 4, and 5).  
 (h) stated by [CÆSAR.BDD](#) version 2.6 to be true on 1 instance(s) out of 4, and false on the remaining 3 instance(s).  
 (i) stated by [CÆSAR.BDD](#) version 2.6 on all 4 instances (2, 3, 4, and 5).  
 (j) stated by [CÆSAR.BDD](#) version 2.6 on all 4 instances (2, 3, 4, and 5).  
 (k) stated by [CÆSAR.BDD](#) version 2.6 on all 4 instances (2, 3, 4, and 5).  
 (l) stated by [CÆSAR.BDD](#) version 2.6 on all 4 instances (2, 3, 4, and 5).  
 (m) stated by [CÆSAR.BDD](#) version 2.6 on all 4 instances (2, 3, 4, and 5).  
 (n) the definition of Nested-Unit Petri Nets (NUPN) is available from <http://mcc.lip6.fr/nupn.php>  
 (o) stated by [CÆSAR.BDD](#) version 2.6 to be false on 1 instance(s) out of 4, and unknown on the remaining 3 instance(s).  
 (p) stated by [CÆSAR.BDD](#) version 2.6 to be true on 1 instance(s) out of 4, and unknown on the remaining 3 instance(s); confirmed at MCC'2014 by Helena on all 4 colored instances.  
 (q) stated by [CÆSAR.BDD](#) version 2.6 to be false on 1 instance(s) out of 4, and unknown on the remaining 3 instance(s).  
 (r) stated by [CÆSAR.BDD](#) version 2.6 to be false on 1 instance(s) out of 4, and unknown on the remaining 3 instance(s).  
 (s) computed at MCC'2013 by Alpina, and ITS-Tools; confirmed at MCC'2014 by Helena.  
 (t) confirmed at MCC'2014 by Helena.  
 (u) computed at MCC'2013 by ITS-Tools; confirmed at MCC'2014 by Helena.

---

(v) computed at MCC'2014 by Helena.

(w) either 270 156, as computed at MCC'2013 by ITS-Tools, or 220 819, as computed at MCC'2014 by Helena.

(x) computed at MCC'2014 by Helena.