CrashCourse — Time PetriNets

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TIK
Time Petri Nets

Timer on Transitions, that restart when:

1. Transition becomes **active**
2. A token from any input place is **removed**
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Tina: Time Ranges

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3. \([a, \infty]\): At least \(a\) time units, no upper bound.
4. \([0, \infty]\): The transition can fire anytime (just like in the normal Petri net).
Your turn to work!
Ex1 a) $5x + y$
Ex1 a) $x - 2y$
Ex1 a) $x \cdot y$: Start by duplicating tokens in $x$
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Ex3.1 a)

- one message every 5 time units → $t_0$.
- Reading / writing from/to BOLT takes 1 time unit each → $t_1$ and $t_2$
- Sending a message in the network takes 1 time unit → $t_3$
- BOLT the network 10% of the time → $t_4$ (9 time units)
Ex3.1 b) Network is not bounded!
Ex3.1 c) BOLT has capacity of 2
Ex3.1 d) Overflow transition $t_5$
Ex3.1 e) Why does adding another token to p5 solve the problem?
Ex3.1 f) Make the input come in bursts
Ex3.1 f) Reduce time on transition t4
Ex3.1 f) duplicate the network multiple times
Ex3.2 b) From LTL to CTL

\[ \Diamond t5 \iff AF t5 \iff \text{No matter what happens, t5 will eventually fire.} \]
No matter what happens, there is no overflow. \[\iff \quad AG \neg t_5 \iff \Box \neg t_5\]
Ex3.2 d) Memory Place p4

[Diagram of a Petri net with places and transitions labeled as follows:
- p0
- p1
- p2
- p3
- p4
- t0
- t1
- t2
- t3
- t5
- t7
- t8

Transitions labeled:
- [2,10] incoming packet
- [1,2] writing
- [1,2] BOLT
- [1,2] reading
- [0,0] overflow
- [0,0] taking resource
- [25,50] network available
- [0,0] release resource
- [0,0] network busy

Arrows indicating transitions between places and states.
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Ex3.2 f) Why 27