# Verification of Cyber-physical Systems : Exercise Sheet 7

Deadline : Monday 27th November 2017, 11 :55 pm

## Exercise 1 : Mutual Exclusion

Implement in *UPPAAL* the following correct model of mutual exclusion.

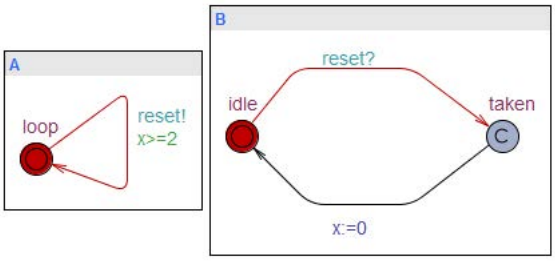
```
#define Aturn false
#define Bturn true

bool x, y, t;

proctype A(){
   x = true;
   t = Bturn;
   (y == false || t = Aturn);
   /* critical section */
   x = false
}

proctype B(){
   y = true;
   t = Aturn;
   (x == false || t = Bturn);
   /* critical section */
   y = false
}

init {run A(); run B()}
```

How can you prove using *UPPAAL* that the model you created actually satisfies mutual exclusion ?

Describe in the PDF version the templates and the declarations you used and submit also the *.xml* file on Ilias.

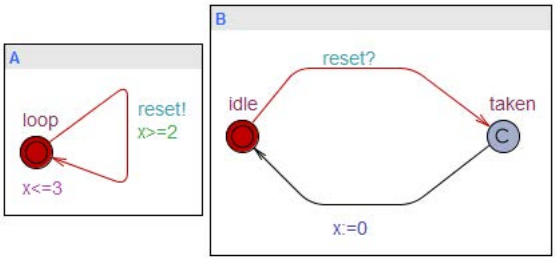
## Exercise 2 : Timed Automata

Consider the following model that consists of two automata running in parallel. Describe in details how the model works.

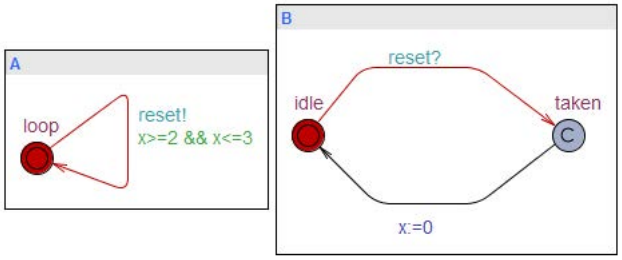


We now want to update the model in order to make the *clock reset* possible only after a delay between 2 and 3.

Below there are exhibited two different modifications of the model.




Modified Model 1




Modified Model 2

For both models describe what has been added, and decide if they meet the requirement.