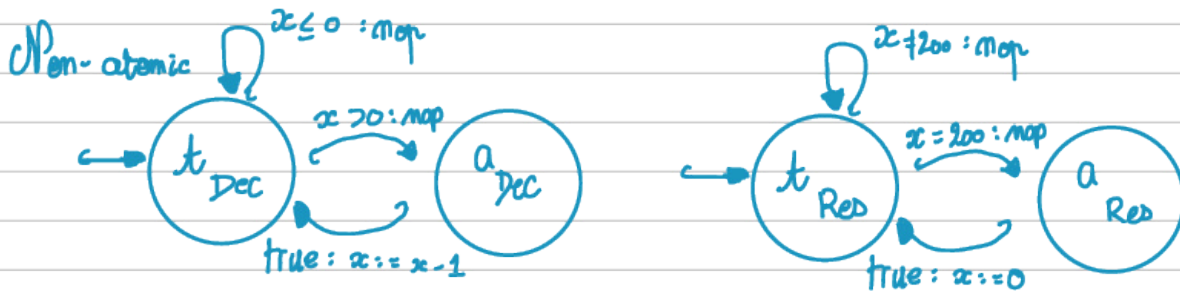
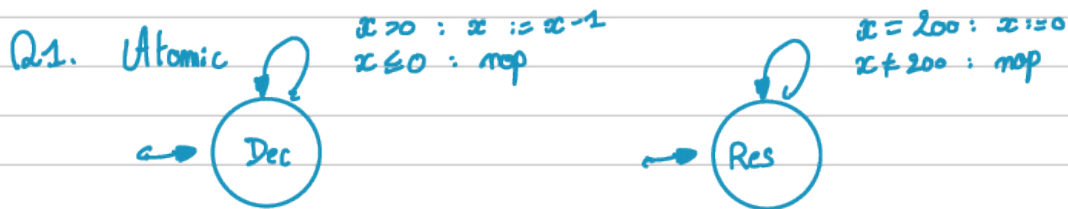
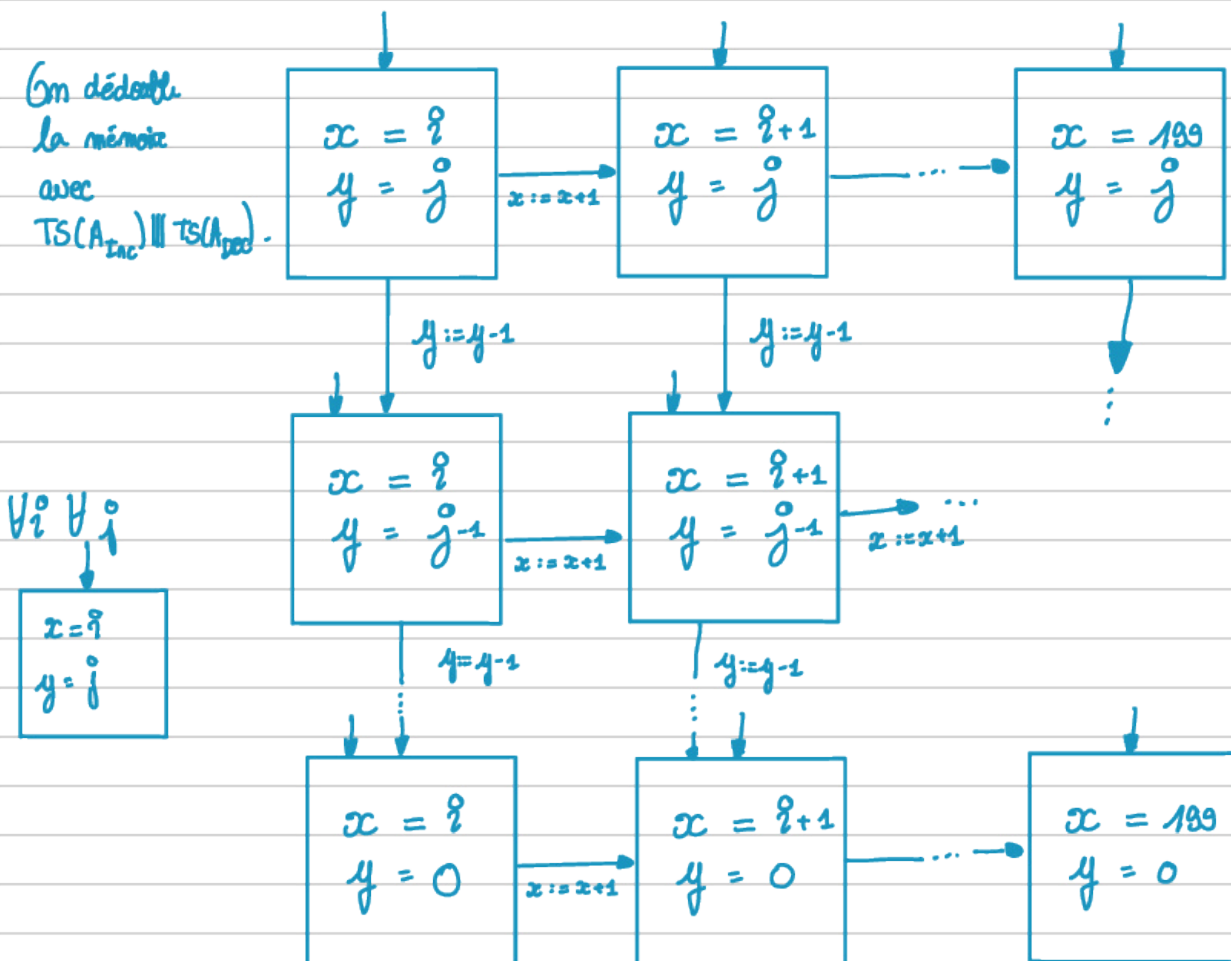
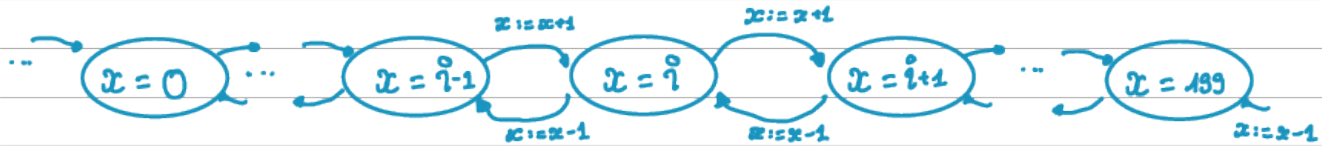


Modelling Concurrent Systems

Exercise 1.

Q2. $TS(A_{\text{Inc}}) \parallel TS(A_{\text{Dec}})$ 

$TS(A_{Inc} \parallel A_{Dec})$:

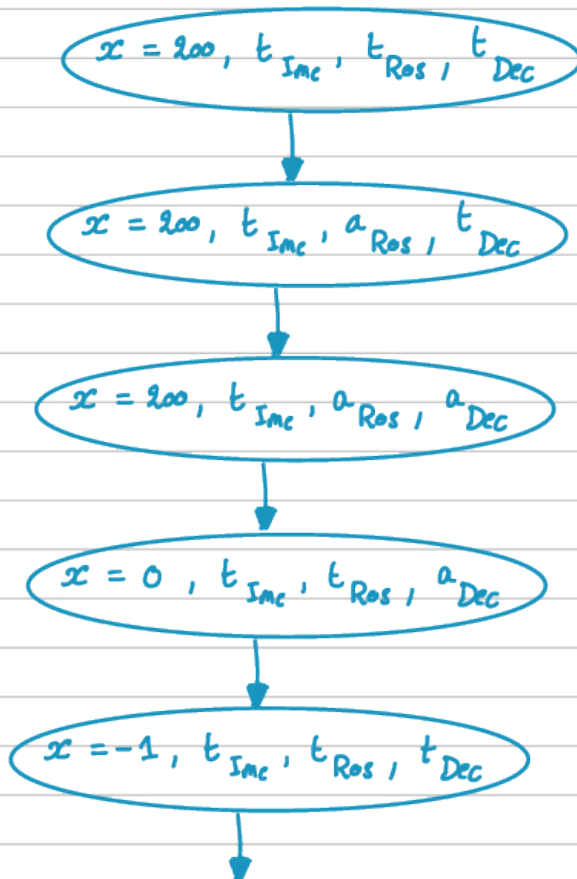


Q 3. Les effets préservent l'invariant :

- pour $x := x + 1$ si $x < 200$ et $0 \leq x \leq 200$ alors $0 \leq x+1 \leq 200$
- pour $x := x - 1$ si $x > 0$ et $0 \leq x \leq 200$ alors $0 \leq x-1 \leq 200$
- pour $x := 0$ si $x = 200$ et $0 \leq x \leq 200$ alors $0 \leq 0 \leq 200$

D'où l'invariant est invariant.

Q 4.

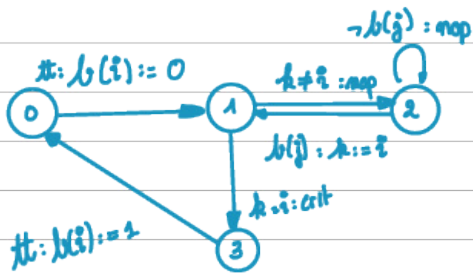


Kaboom! on a cassé l'invariant!

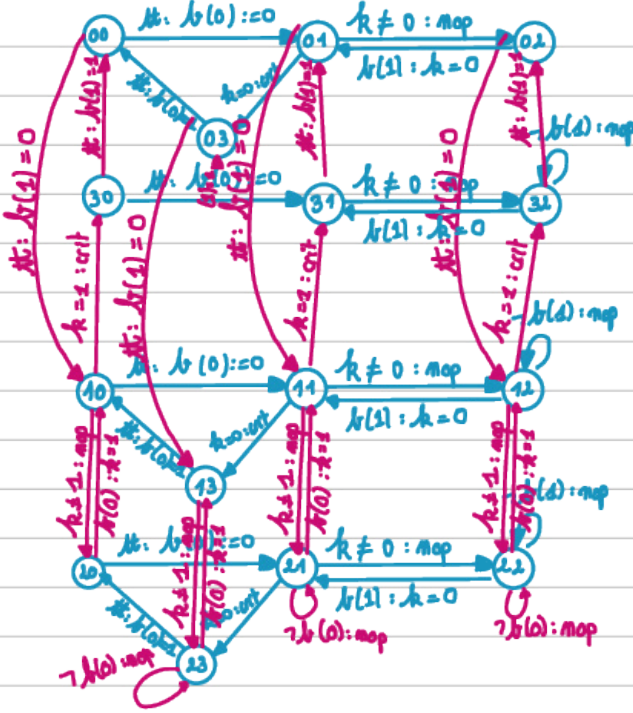
Exercice 2.

Q1.

Q1.



Q2.



Q3. The state 33 is unreachable.
Thus, we ensure mutual exclusion.

Exercise 3.

Im ex 1 / Q2.

we have a state $x = 1$
 $x' = 0$

we don't have that in

$$TS(PG_1 \parallel PG_2).$$