TD 1 - TLA^+

Laérian B. - 2SN-L

Exercice - Factorielle

Module fact1

MODULE fact0 EXTENDS Naturals CONSTANT N ASSUME $N \in Nat$ VARIABLE res Init $\triangleq TRUE$

$$egin{aligned} \operatorname{Next} & riangleq \mathit{res}' = N! \ (\ \operatorname{ou} \ \sum_{i=1}^N i) \ \\ \operatorname{Spec} & riangleq \mathit{Init} \wedge \square [Next]_{res} \end{aligned}$$

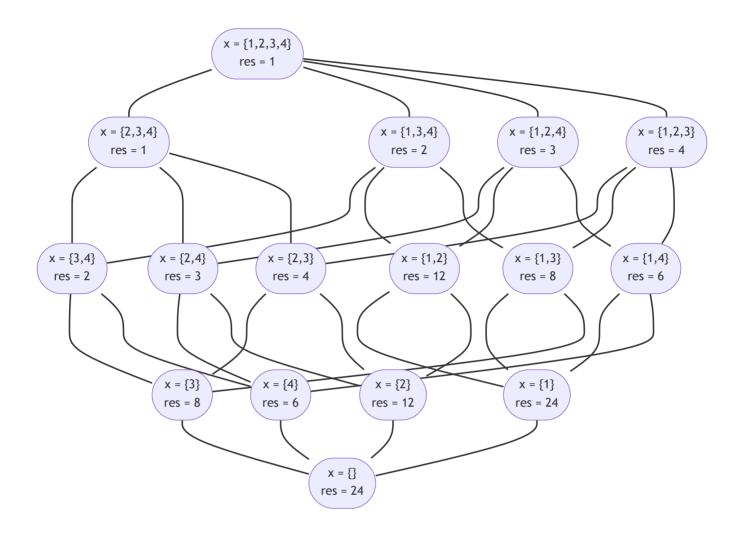
Module fact2

$$\begin{array}{l} \text{MODULE fact2} \\ \text{CONSTANT } N \\ \text{VARIABLE } res, \ i \\ \\ \text{Init } \stackrel{\triangle}{=} \begin{array}{l} \wedge i = 1 \\ \wedge res = 1 \end{array} \\ \\ \wedge i \leqslant N \\ \text{OneMult } \stackrel{\triangle}{=} \wedge i' = i+1 \\ \\ \wedge res' = res \times i \\ \\ \wedge i \leqslant N-1 \\ \text{TwoMult } \stackrel{\triangle}{=} \wedge i' = i+2 \\ \\ \wedge res' = res \times i \times (i+1) \end{array} \\ \text{Next } \stackrel{\triangle}{=} \begin{array}{l} OneMult \vee TwoMult \\ \text{Spec } \stackrel{\triangle}{=} \begin{array}{l} Init \wedge \square[Next]_{res,i} \end{array} \end{array}$$

Module fact3

$$\begin{array}{l} \text{MODULE fact3} \\ \text{CONSTANT } N \\ \text{VARIABLE } res, \ x \\ \text{Init } \triangleq \begin{array}{l} \wedge \, res = 1 \\ \wedge \, x = 1..N \end{array} \\ & \qquad \qquad \wedge \, p \in x \\ \text{OneMult(p)} \triangleq \begin{array}{l} \wedge \, res' = res \times p \\ \wedge \, x' = x \setminus \{p\} \end{array} \\ \text{Next } \triangleq \forall a \in Nat : OneMult(a) \\ \text{Spec} \triangleq Init \wedge \Box [Next]_{res,x} \end{array}$$

Représentation graphique pour les cauchemars



Plus jamais je fais ça