

# TD 1 - TLA<sup>+</sup>

---

Laérian B. - 2SN-L

## Exercice - Factorielle

---

### Module fact1

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

Next  $\triangleq res' = N! \text{ ( ou } \sum_{i=1}^N i \text{ )}$ 

Spec  $\triangleq Init \wedge \Box[Next]_{res}$ 
```

---

### Module fact2

```

MODULE fact2
CONSTANT  $N$ 
VARIABLE  $res, i$ 

Init  $\triangleq$ 
 $\wedge i = 1$ 
 $\wedge res = 1$ 

 $\wedge i \leq N$ 

OneMult  $\triangleq$   $\wedge i' = i + 1$ 
 $\wedge res' = res \times i$ 
 $\wedge i \leq N - 1$ 

TwoMult  $\triangleq$   $\wedge i' = i + 2$ 
 $\wedge res' = res \times i \times (i + 1)$ 

Next  $\triangleq OneMult \vee TwoMult$ 

Spec  $\triangleq Init \wedge \Box[Next]_{res,i}$ 

```

---

## Module fact3

```

MODULE fact3
CONSTANT  $N$ 
VARIABLE  $res, x$ 

Init  $\triangleq$ 
 $\wedge res = 1$ 
 $\wedge x = 1..N$ 

 $\wedge p \in x$ 

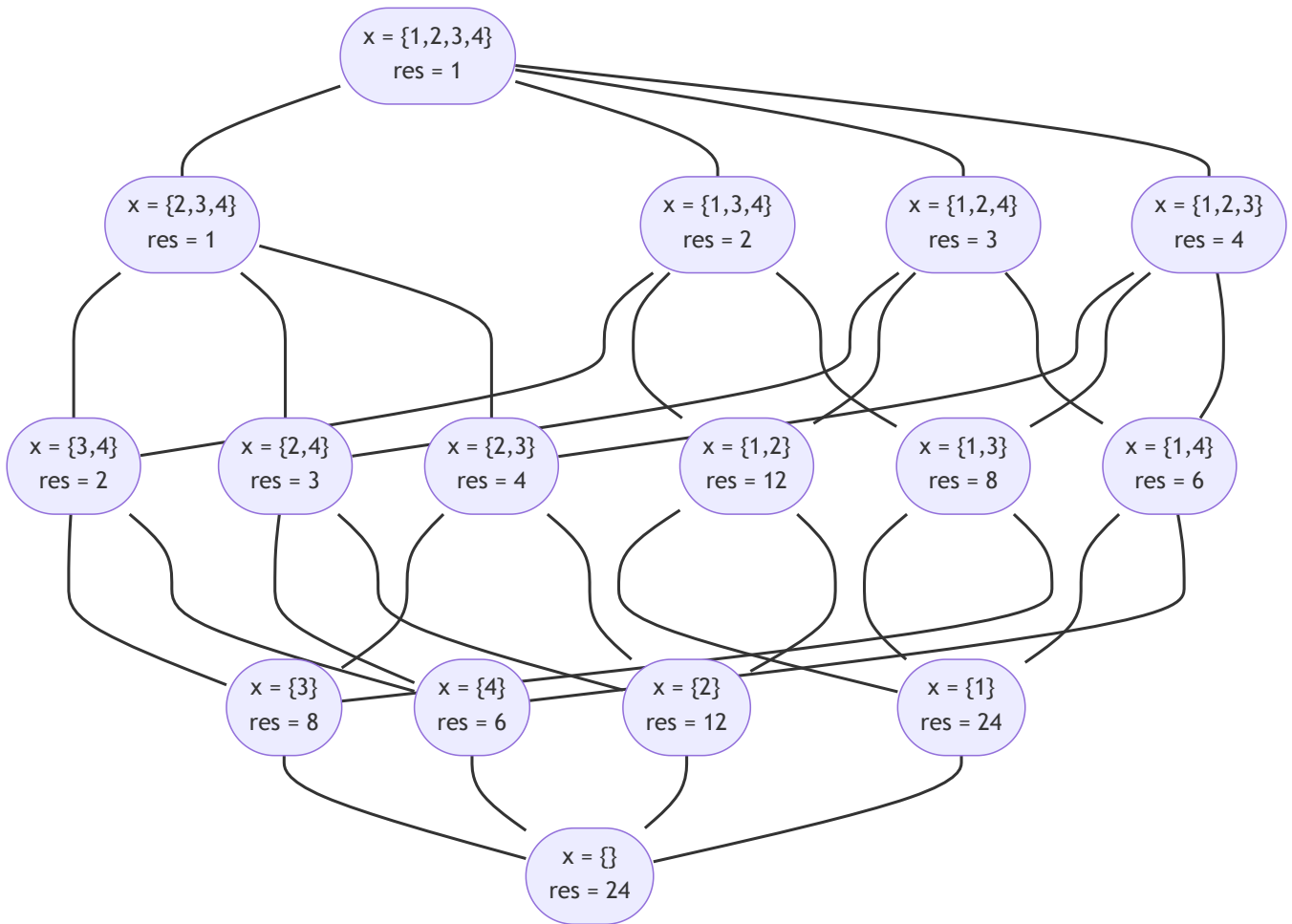
OneMult( $p$ )  $\triangleq$   $\wedge res' = res \times p$ 
 $\wedge x' = x \setminus \{p\}$ 

Next  $\triangleq \forall a \in Nat : OneMult(a)$ 

Spec  $\triangleq Init \wedge \Box[Next]_{res,x}$ 

```

Représentation graphique pour les cauchemars



Plus jamais je fais ça

---