Partages de décomposants de Goldbach de 6 en 6 : le modèle des interrupteurs, Denise Vella-Chemla pilotant l'ia gemini, juillet 2026

Le filtre modulo 6 et l'espace des cases vides

Soit n un entier pair tel que $n \equiv 2 \pmod 6$. Les sinusoïdes associées aux nombres premiers $p = 2$ et $p = 3$ imposent une grille de contraintes fixe. L'ensemble des candidats résiduels (les cases vides) dans l'intervalle d'étude est défini par :

$$\mathcal{E}_n = \{x \in [3, n-3] \mid x \equiv 1 \pmod 6\}$$

Fonction indicatrice d'interrupteur

Pour chaque nombre premier p tel que $5 \leq p \leq \sqrt{n}$, on définit la fonction interrupteur $I_{n,p}(x)$ sur la famille des complémentaires par [1] :

$$I_{n,p}(x) = \begin{cases} 1 & \text{si } x \not\equiv n \pmod p \\ 0 & \text{si } x \equiv n \pmod p \end{cases}$$

La conjecture de Goldbach est vérifiée pour n s'il existe au moins un point $x \in \mathcal{E}_n$ tel que :

$$\prod_{5 \leq p \leq \sqrt{n}} I_{n,p}(x) = 1$$

Opérateur de translation et conservation

Lors du passage de n à $n + 6$, la forme modulo 6 est préservée. L'évolution de l'interrupteur complémentaire suit une loi de translation pure :

$$I_{n+6,p}(x) = I_{n,p}(x - 6)$$

Puisque $\text{pgcd}(6, p) = 1$ pour tout $p \geq 5$, l'application de cette translation sur une période complète $\mathcal{P} = \{1, 7, 13, \ldots, 1 + 6(p-1)\}$ induit une permutation circulaire des états. Le nombre total d'interrupteurs ouverts reste invariant :

$$\sum_{x \in \mathcal{P}} I_{n+6,p}(x) = \sum_{x \in \mathcal{P}} I_{n,p}(x) = p - 1$$

Ce mécanisme de "vases communicants" garantit que chaque extinction locale (une case qui se bouche) est mathématiquement compensée par une ouverture (une case qui se libère).

Annexe : programme de simulation des interrupteurs

```
import math

def simuler_transition_goldbach(n):
    print(f"\n═══════════════ TRANSITION {n} -> {n+6} ═══════════════")
```

1. Un interrupteur égal à 1 signifie que la case est libre ; égal à 0, la case ne l'est pas.

```
    etapes = [n, n+6]
    for en in etapes:
        print(f"\n——  tude  pour n = {en} (Forme: 6k+{en%6}) ——")
        limite_racine = int(math.sqrt(n+6))
        primes_sup = [5] if limite_racine >= 5 else []
        cases_vides = [x for x in range(3, en-2) if x % 6 == 1]
        print(f"Cases libres modulo 6 (x = 1 mod 6) :\n{cases_vides}")
        for x in cases_vides:
            etat_global = 1
            details = []
            for p in primes_sup:
                if x % p == en % p:
                    interrupteur = 0
                    etat_global = 0
                else:
                    interrupteur = 1
                details.append(f"I_{p}={interrupteur} (x%={x%p}, n%={en%p})")
            status = "  O (Decomposant !)" if etat_global == 1 else "  X"
            print(f"  Case x = {x:2d} : {status} | {' / '.join(details) if details else '

for n in range(6,104,2):
    simuler_transition_goldbach(n)
```

et le résultat du programme ci-dessus

```
================ TRANSITION 6 -> 12 ================

——  tude  pour n = 6 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        []

——  tude  pour n = 12 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7]
  Case x =  7 :  O (Decomposant !) | Pas de filtre p>=5

================ TRANSITION 8 -> 14 ================

——  tude  pour n = 8 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        []

——  tude  pour n = 14 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7]
  Case x =  7 :  O (Decomposant !) | Pas de filtre p>=5

================ TRANSITION 10 -> 16 ================

——  tude  pour n = 10 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
```

```
                              [7]
  Case x =  7 :   O (Decomposant !) | Pas de filtre p>=5

—— tude pour n = 16 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                              [7, 13]
  Case x =  7 :   O (Decomposant !) | Pas de filtre p>=5
  Case x = 13 :   O (Decomposant !) | Pas de filtre p>=5

================ TRANSITION 12 -> 18 ================

—— tude pour n = 12 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                              [7]
  Case x =  7 :   O (Decomposant !) | Pas de filtre p>=5

—— tude pour n = 18 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                              [7, 13]
  Case x =  7 :   O (Decomposant !) | Pas de filtre p>=5
  Case x = 13 :   O (Decomposant !) | Pas de filtre p>=5

================ TRANSITION 14 -> 20 ================

—— tude pour n = 14 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                              [7]
  Case x =  7 :   O (Decomposant !) | Pas de filtre p>=5

—— tude pour n = 20 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                              [7, 13]
  Case x =  7 :   O (Decomposant !) | Pas de filtre p>=5
  Case x = 13 :   O (Decomposant !) | Pas de filtre p>=5

================ TRANSITION 16 -> 22 ================

—— tude pour n = 16 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                              [7, 13]
  Case x =  7 :   O (Decomposant !) | Pas de filtre p>=5
  Case x = 13 :   O (Decomposant !) | Pas de filtre p>=5

—— tude pour n = 22 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                              [7, 13, 19]
  Case x =  7 :   O (Decomposant !) | Pas de filtre p>=5
  Case x = 13 :   O (Decomposant !) | Pas de filtre p>=5
  Case x = 19 :   O (Decomposant !) | Pas de filtre p>=5

================ TRANSITION 18 -> 24 ================

—— tude pour n = 18 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                              [7, 13]
```

```
  Case x =  7 :   O (Decomposant !) | Pas de filtre p>=5
  Case x = 13 :   O (Decomposant !) | Pas de filtre p>=5

—— tude pour n = 24 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19]
  Case x =  7 :   O (Decomposant !) | Pas de filtre p>=5
  Case x = 13 :   O (Decomposant !) | Pas de filtre p>=5
  Case x = 19 :   O (Decomposant !) | Pas de filtre p>=5

================ TRANSITION 20 -> 26 ================

—— tude pour n = 20 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)

—— tude pour n = 26 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)

================ TRANSITION 22 -> 28 ================

—— tude pour n = 22 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19]
  Case x =  7 :  X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)

—— tude pour n = 28 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)

================ TRANSITION 24 -> 30 ================

—— tude pour n = 24 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)

—— tude pour n = 30 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
```

```
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)

================ TRANSITION 26 -> 32 ================

—— tude pour n = 26 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)

—— tude pour n = 32 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)

================ TRANSITION 28 -> 34 ================

—— tude pour n = 28 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)

—— tude pour n = 34 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)

================ TRANSITION 30 -> 36 ================

—— tude pour n = 30 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)

—— tude pour n = 36 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
```

```
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)

================ TRANSITION 32 -> 38 ================

--- tude pour n = 32 (Forme: 6k+2) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)

--- tude pour n = 38 (Forme: 6k+2) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)

================ TRANSITION 34 -> 40 ================

--- tude pour n = 34 (Forme: 6k+4) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)

--- tude pour n = 40 (Forme: 6k+4) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)

================ TRANSITION 36 -> 42 ================

--- tude pour n = 36 (Forme: 6k+0) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
```

```
—— tude pour n = 42 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)

================ TRANSITION 38 -> 44 ================

—— tude pour n = 38 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)

—— tude pour n = 44 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)

================ TRANSITION 40 -> 46 ================

—— tude pour n = 40 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)

—— tude pour n = 46 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)

================ TRANSITION 42 -> 48 ================
```

```
—— tude pour n = 42 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)

—— tude pour n = 48 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)

================ TRANSITION 44 -> 50 ================

—— tude pour n = 44 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)

—— tude pour n = 50 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)

================ TRANSITION 46 -> 52 ================

—— tude pour n = 46 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
```

```
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)

—— tude pour n = 52 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)

================ TRANSITION 48 -> 54 ================

—— tude pour n = 48 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)

—— tude pour n = 54 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 49 :   X | I_5=0 (x%=4, n%=4)

================ TRANSITION 50 -> 56 ================

—— tude pour n = 50 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)

—— tude pour n = 56 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
```

```
                          [7, 13, 19, 25, 31, 37, 43, 49]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)

================ TRANSITION 52 -> 58 ================

—— tude pour n = 52 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                          [7, 13, 19, 25, 31, 37, 43, 49]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)

—— tude pour n = 58 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                          [7, 13, 19, 25, 31, 37, 43, 49, 55]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)

================ TRANSITION 54 -> 60 ================

—— tude pour n = 54 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                          [7, 13, 19, 25, 31, 37, 43, 49]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 49 :   X | I_5=0 (x%=4, n%=4)

—— tude pour n = 60 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                          [7, 13, 19, 25, 31, 37, 43, 49, 55]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
```

```
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 55 :   X | I_5=0 (x%=0, n%=0)

================ TRANSITION 56 -> 62 ================

—— tude pour n = 56 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)

—— tude pour n = 62 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)

================ TRANSITION 58 -> 64 ================

—— tude pour n = 58 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)

—— tude pour n = 64 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
```

```
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 49 :   X | I_5=0 (x%=4, n%=4)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)

================ TRANSITION 60 -> 66 ================

--- tude pour n = 60 (Forme: 6k+0) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 55 :   X | I_5=0 (x%=0, n%=0)

--- tude pour n = 66 (Forme: 6k+0) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 61 :   X | I_5=0 (x%=1, n%=1)

================ TRANSITION 62 -> 68 ================

--- tude pour n = 62 (Forme: 6k+2) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
```

```
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)

—— tude pour n = 68 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)

================ TRANSITION 64 -> 70 ================

—— tude pour n = 64 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 49 :   X | I_5=0 (x%=4, n%=4)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)

—— tude pour n = 70 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 55 :   X | I_5=0 (x%=0, n%=0)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)

================ TRANSITION 66 -> 72 ================
```

```
—— tude pour n = 66 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 61 :   X | I_5=0 (x%=1, n%=1)

—— tude pour n = 72 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 67 :   X | I_5=0 (x%=2, n%=2)

================ TRANSITION 68 -> 74 ================

—— tude pour n = 68 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)

—— tude pour n = 74 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
```

```
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 49 :   X | I_5=0 (x%=4, n%=4)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)

================ TRANSITION 70 -> 76 ================

--- tude pour n = 70 (Forme: 6k+4) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 55 :   X | I_5=0 (x%=0, n%=0)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)

--- tude pour n = 76 (Forme: 6k+4) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 61 :   X | I_5=0 (x%=1, n%=1)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)

================ TRANSITION 72 -> 78 ================

--- tude pour n = 72 (Forme: 6k+0) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
```

```
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 67 :   X | I_5=0 (x%=2, n%=2)

—— tude pour n = 78 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 73 :   X | I_5=0 (x%=3, n%=3)

================ TRANSITION 74 -> 80 ================

—— tude pour n = 74 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 49 :   X | I_5=0 (x%=4, n%=4)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)

—— tude pour n = 80 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 55 :   X | I_5=0 (x%=0, n%=0)
```

```
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)

================ TRANSITION 76 -> 82 ================

--- tude pour n = 76 (Forme: 6k+4) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 61 :   X | I_5=0 (x%=1, n%=1)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)

--- tude pour n = 82 (Forme: 6k+4) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 67 :   X | I_5=0 (x%=2, n%=2)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)

================ TRANSITION 78 -> 84 ================

--- tude pour n = 78 (Forme: 6k+0) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
```

```
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 73 :   X | I_5=0 (x%=3, n%=3)

—— tude pour n = 84 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 49 :   X | I_5=0 (x%=4, n%=4)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 79 :   X | I_5=0 (x%=4, n%=4)

================ TRANSITION 80 -> 86 ================

—— tude pour n = 80 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 55 :   X | I_5=0 (x%=0, n%=0)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)

—— tude pour n = 86 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
```

```
  Case x = 61 :   X | I_5=0 (x%=1, n%=1)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)

================ TRANSITION 82 -> 88 ================

--- tude pour n = 82 (Forme: 6k+4) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 67 :   X | I_5=0 (x%=2, n%=2)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)

--- tude pour n = 88 (Forme: 6k+4) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 73 :   X | I_5=0 (x%=3, n%=3)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)

================ TRANSITION 84 -> 90 ================

--- tude pour n = 84 (Forme: 6k+0) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
```

```
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 49 :   X | I_5=0 (x%=4, n%=4)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 79 :   X | I_5=0 (x%=4, n%=4)

—— tude pour n = 90 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 55 :   X | I_5=0 (x%=0, n%=0)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 85 :   X | I_5=0 (x%=0, n%=0)

================ TRANSITION 86 -> 92 ================

—— tude pour n = 86 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 61 :   X | I_5=0 (x%=1, n%=1)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)

—— tude pour n = 92 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
```

```
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 67 :   X | I_5=0 (x%=2, n%=2)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)

================ TRANSITION 88 -> 94 ================

--- tude pour n = 88 (Forme: 6k+4) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 73 :   X | I_5=0 (x%=3, n%=3)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)

--- tude pour n = 94 (Forme: 6k+4) ---
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 49 :   X | I_5=0 (x%=4, n%=4)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 79 :   X | I_5=0 (x%=4, n%=4)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 91 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)

================ TRANSITION 90 -> 96 ================
```

```
—— tude pour n = 90 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 55 :   X | I_5=0 (x%=0, n%=0)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 85 :   X | I_5=0 (x%=0, n%=0)

—— tude pour n = 96 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 61 :   X | I_5=0 (x%=1, n%=1)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 91 :   X | I_5=0 (x%=1, n%=1)

================ TRANSITION 92 -> 98 ================

—— tude pour n = 92 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
```

```
  Case x = 67 :   X | I_5=0 (x%=2, n%=2)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)

—— tude pour n = 98 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 73 :   X | I_5=0 (x%=3, n%=3)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 91 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)

================ TRANSITION 94 -> 100 ================

—— tude pour n = 94 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 49 :   X | I_5=0 (x%=4, n%=4)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 79 :   X | I_5=0 (x%=4, n%=4)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 91 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)

—— tude pour n = 100 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91, 97]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
```

```
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 55 :   X | I_5=0 (x%=0, n%=0)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 85 :   X | I_5=0 (x%=0, n%=0)
  Case x = 91 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 97 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)

================ TRANSITION 96 -> 102 ================

—— tude pour n = 96 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 61 :   X | I_5=0 (x%=1, n%=1)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 91 :   X | I_5=0 (x%=1, n%=1)

—— tude pour n = 102 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91, 97]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 67 :   X | I_5=0 (x%=2, n%=2)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 91 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 97 :   X | I_5=0 (x%=2, n%=2)
```

```
================ TRANSITION 98 -> 104 ================

—— tude pour n = 98 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 73 :   X | I_5=0 (x%=3, n%=3)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 91 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)

—— tude pour n = 104 (Forme: 6k+2) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91, 97]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 19 :   X | I_5=0 (x%=4, n%=4)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 49 :   X | I_5=0 (x%=4, n%=4)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=4)
  Case x = 79 :   X | I_5=0 (x%=4, n%=4)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=4)
  Case x = 91 :   O (Decomposant !) | I_5=1 (x%=1, n%=4)
  Case x = 97 :   O (Decomposant !) | I_5=1 (x%=2, n%=4)

================ TRANSITION 100 -> 106 ================

—— tude pour n = 100 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91, 97]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 25 :   X | I_5=0 (x%=0, n%=0)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
```

```
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 55 :   X | I_5=0 (x%=0, n%=0)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=0)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=0)
  Case x = 85 :   X | I_5=0 (x%=0, n%=0)
  Case x = 91 :   O (Decomposant !) | I_5=1 (x%=1, n%=0)
  Case x = 97 :   O (Decomposant !) | I_5=1 (x%=2, n%=0)

—— tude pour n = 106 (Forme: 6k+4) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91, 97, 103]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 31 :   X | I_5=0 (x%=1, n%=1)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 61 :   X | I_5=0 (x%=1, n%=1)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=1)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=1)
  Case x = 91 :   X | I_5=0 (x%=1, n%=1)
  Case x = 97 :   O (Decomposant !) | I_5=1 (x%=2, n%=1)
  Case x = 103 :   O (Decomposant !) | I_5=1 (x%=3, n%=1)

================ TRANSITION 102 -> 108 ================

—— tude pour n = 102 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91, 97]
  Case x =  7 :   X | I_5=0 (x%=2, n%=2)
  Case x = 13 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 37 :   X | I_5=0 (x%=2, n%=2)
  Case x = 43 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
  Case x = 67 :   X | I_5=0 (x%=2, n%=2)
  Case x = 73 :   O (Decomposant !) | I_5=1 (x%=3, n%=2)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=2)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=2)
  Case x = 91 :   O (Decomposant !) | I_5=1 (x%=1, n%=2)
```

```
  Case x = 97 :   X | I_5=0 (x%=2, n%=2)

—— tude pour n = 108 (Forme: 6k+0) ——
Cases libres modulo 6 (x = 1 mod 6) :
                        [7, 13, 19, 25, 31, 37, 43, 49,
                         55, 61, 67, 73, 79, 85, 91, 97, 103]
  Case x =  7 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 13 :   X | I_5=0 (x%=3, n%=3)
  Case x = 19 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 25 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 31 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 37 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 43 :   X | I_5=0 (x%=3, n%=3)
  Case x = 49 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 55 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 61 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 67 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 73 :   X | I_5=0 (x%=3, n%=3)
  Case x = 79 :   O (Decomposant !) | I_5=1 (x%=4, n%=3)
  Case x = 85 :   O (Decomposant !) | I_5=1 (x%=0, n%=3)
  Case x = 91 :   O (Decomposant !) | I_5=1 (x%=1, n%=3)
  Case x = 97 :   O (Decomposant !) | I_5=1 (x%=2, n%=3)
  Case x = 103 :   X | I_5=0 (x%=3, n%=3)
```