

PRÁCTICA N°2

- ① Para resolver el problema de PS12 debemos definir:

Dominio = { ROLLO, SALVO, SOLAR, ROCAS, OCIOS, SILOS }

Variaciones = { $x_1, x_2, x_3, x_4, x_5, x_6$

donde: $x_i = (x_{i1}, x_{i2}, \dots, x_{i5})$ para $i = \{1, 2, \dots, 6\}$

Restricciones = { $x_{11} = x_{41}$ (cruce de la palabra N°1 con N°4),

$x_{24} = x_{43}$ (cruce de la palabra N°2 con N°4),

$x_{31} = x_{45}$ (cruce de la palabra N°3 con N°4),

$x_{15} = x_{51}$ (cruce de la palabra N°1 con N°5),

$x_{35} = x_{53}$ (cruce de la palabra N°3 con N°5),

$x_{62} = x_{53}$ (cruce de la palabra N°6 con N°5),

todos distintos $(x_1, x_2, x_3, \dots, x_6)$ }

- ② De manera gráfica, si comenzamos con la palabra ROLLO en la primera ubicación:



ROLLO	ROLLO	ROLLO	ROLLO	ROLLO
SALVO	SALVO	SALVO	SALVO	SALVO
ROLLO	SOLAR	SOLAR	SOLAR	SOLAR
ROCAS.	ROCAS.	ROCAS.	ROCAS.	ROCAS.
OCIOS	OCIOS	OCIOS	OCIOS	OCIOS
SILOS	SILOS	SILOS	SILOS	SILOS



ROLLO	ROLLO	ROLLO	ROLLO	ROLLO
SALVO	SALVO	SALVO	SALVO	SALVO
SOLAR	SOLAR	SOLAR	SOLAR	SOLAR
ROCAS.	ROCAS.	ROCAS.	ROCAS.	ROCAS.
OCIOS	OCIOS	OCIOS	OCIOS	OCIOS
SILOS	SILOS	SILOS	SILOS	SILOS

entonces la 2da palabra se queda sin opciones por lo que no podemos encontrar solución comenzando por ROLLO.

Si ahora creemos comentar por SALVO como potencia 1 tenemos lo siguiente:

SALVO	ROLLO	DELLO	DELDO	ROLLO
SALVO	SALVO	SALVO	SALVO	SALVO
SOLAR	SOLAR	SOLAR	SOLAR	SOLAR
ROCAS	ROCAS	ROCAS	ROCAS	ROCAS
OCIOS	OCIOS	OCIOS	OCIOS	OCIOS
SILOS	SILOS	SILOS	SILOS	SILOS

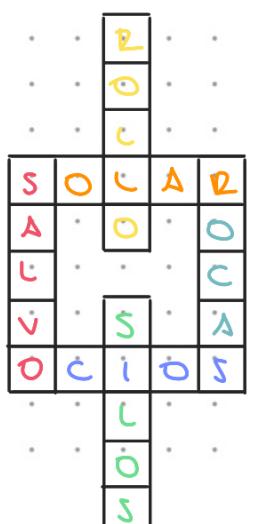
SALVO	ROLLO	DELLO	DELDO	ROLLO
SALVO	SALVO	SALVO	SALVO	SALVO
SOLAR	SOLAR	SOLAR	SOLAR	SOLAR
ROCAS	ROCAS	ROCAS	ROCAS	ROCAS
OCIOS	OCIOS	OCIOS	OCIOS	OCIOS
SILOS	SILOS	SILOS	SILOS	SILOS

SALVO	ROLLO	DELLO	DELDO	ROLLO
SALVO	SALVO	SALVO	SALVO	SALVO
SOLAR	SOLAR	SOLAR	SOLAR	SOLAR
ROCAS	ROCAS	ROCAS	ROCAS	ROCAS
OCIOS	OCIOS	OCIOS	OCIOS	OCIOS
SILOS	SILOS	SILOS	SILOS	SILOS

SALVO	ROLLO	DELLO	DELDO	ROLLO
SALVO	SALVO	SALVO	SALVO	SALVO
SOLAR	SOLAR	SOLAR	SOLAR	SOLAR
ROCAS	ROCAS	ROCAS	ROCAS	ROCAS
OCIOS	OCIOS	OCIOS	OCIOS	OCIOS
SILOS	SILOS	SILOS	SILOS	SILOS

SALVO → OCIOS → SILOS → SOLAR

→ ROLLO → ROCAS



$$x_i \in \{P_1, P_2, P_3, P_4, P_5, P_6\}$$

$$H_i \in \{1, 2, \dots, 6\}$$

↓

$$x_1 = P_1 \quad \text{comentando por la elección de ROLLO}$$

$$x_2 \in \{P_2, \dots, P_6\}$$

$$x_3 \in \{P_2, \dots, P_6\}$$

$$x_4 \in \{P_4\}$$

$$x_5 \in \{P_5\}$$

$$x_6 \in \{P_2, \dots, P_6\}$$

↓

$$x_1 = P_1$$

$x_2 \in \{\}$

$$x_3 \in \{P_2, P_3, P_6\}$$

$$x_4 = P_4$$

$$x_5 \in \{P_5\}$$

$$x_6 \in \{P_2, P_3, P_5, P_6\}$$

$$x_i \in \{P_1, P_2, P_3, P_4, P_5, P_6\}$$

$$H_i \in \{1, 2, \dots, 6\}$$

↓

$$x_1 = P_2 \quad \text{comentando por la elección de VALOR}$$

$$x_2 \in \{P_1, P_3, \dots, P_6\}$$

$$x_3 \in \{P_1, P_3, \dots, P_6\}$$

$$x_4 \in \{P_3, P_6\}$$

$$x_5 \in \{P_5\}$$

$$x_6 \in \{P_1, P_3, \dots, P_6\}$$

↓

$$x_1 = P_2$$

$$x_2 \in \{P_1, P_3, P_4, P_6\}$$

$$x_3 \in \{P_4, P_6\}$$

$$x_4 \in \{P_3, P_6\}$$

$$x_5 = P_5$$

$$x_6 \in \{P_6\}$$

↓

$$x_1 = P_2$$

$$x_2 \in \{P_1, P_3, P_4\}$$

$$x_3 \in \{P_4\}$$

$$x_4 \in \{P_3\}$$

$$x_5 = P_5$$

$$x_6 = P_6$$

↓

$$x_1 = P_2$$

$$x_2 \in \{P_1\}$$

$$x_3 = P_4$$

$$x_4 \in \{P_3\}$$

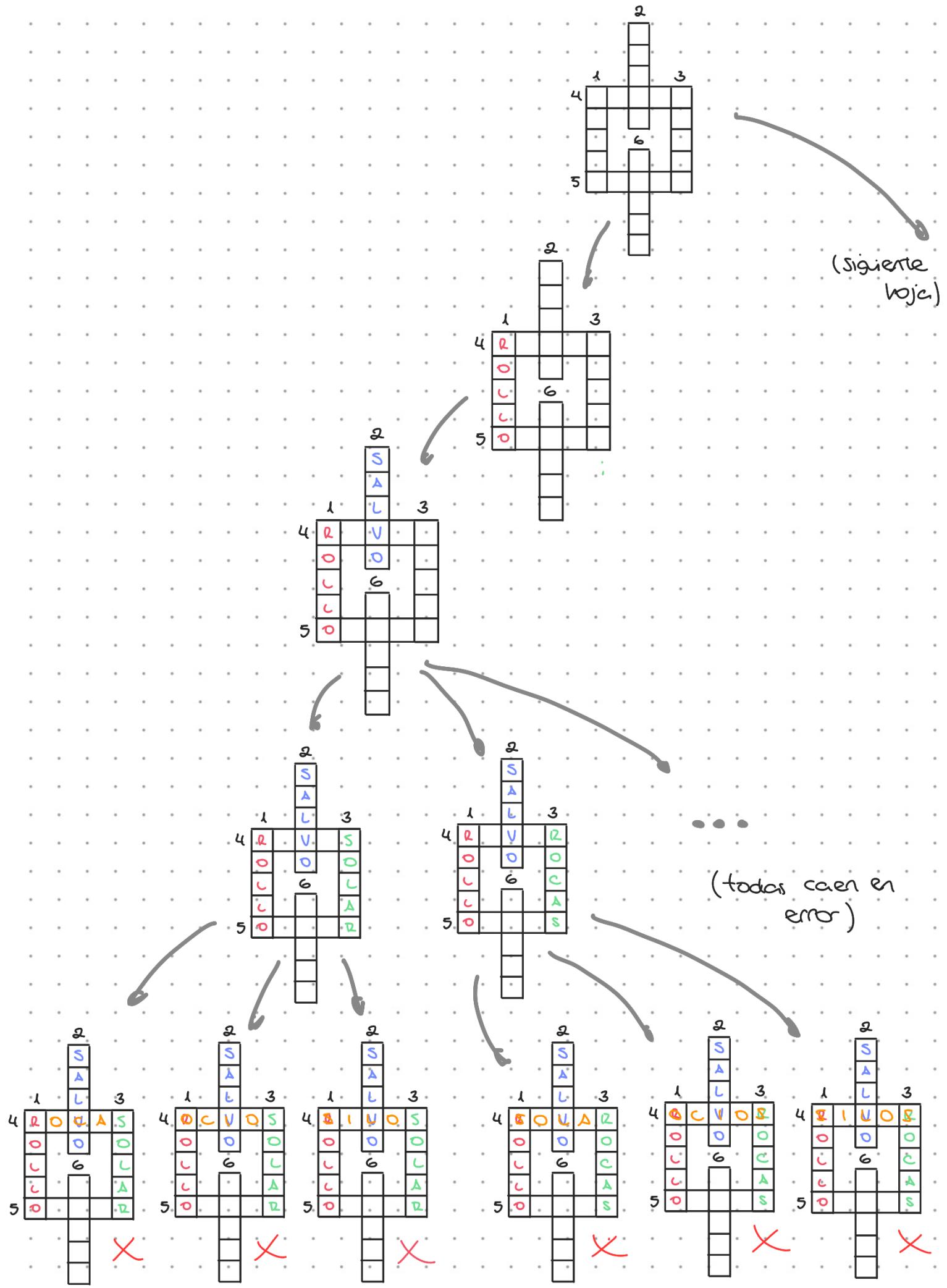
$$x_5 = P_5$$

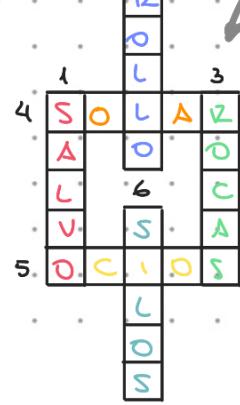
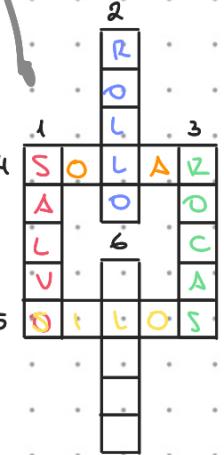
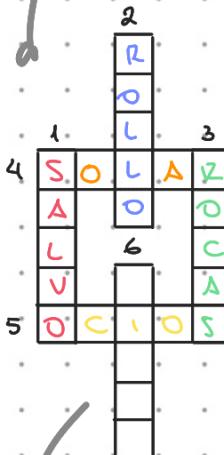
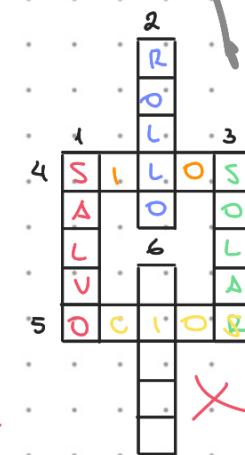
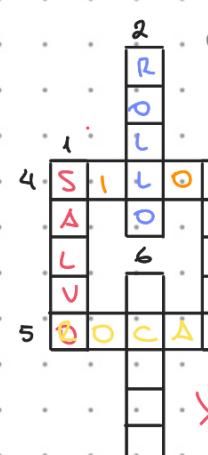
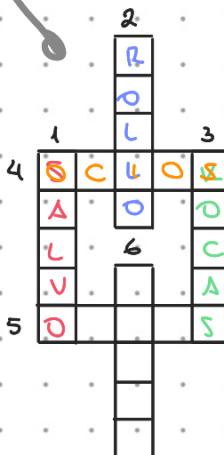
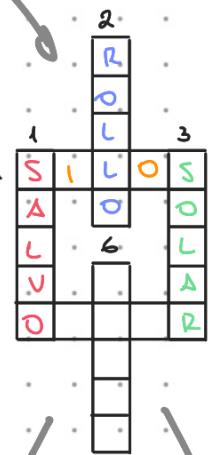
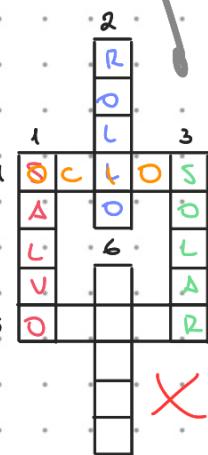
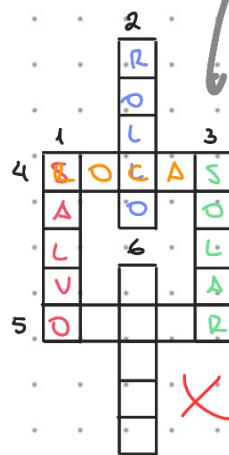
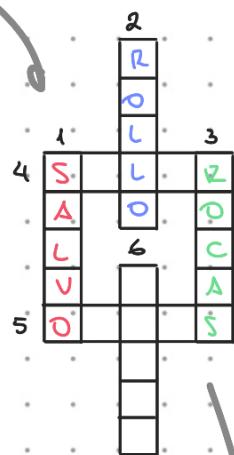
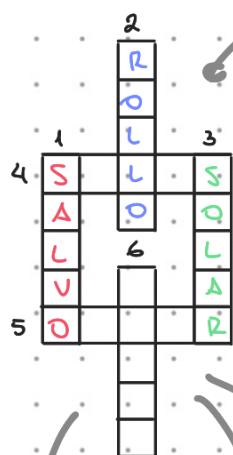
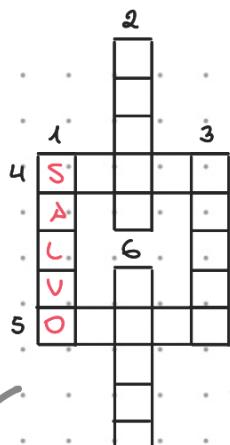
$$x_6 = P_6$$

→

$x_1 = P_2$
$x_2 = P_1$
$x_3 = P_4$
$x_4 = P_3$
$x_5 = P_5$
$x_6 = P_6$

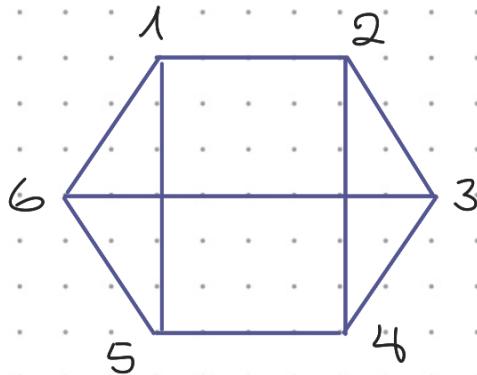
6) Aplicando Backtracking cronológico





⇒ Solución.

(2)



$$\text{Variables} = \{x_1, x_2, x_3, x_4, x_5, x_6\}$$

dónde $x_i = x_{(f_i, p_i)}$ para $i \in \{1, 2, \dots, 6\}$

$$\text{Dominio} = \{ \overset{a_1}{A}(20,1), \overset{a_2}{B}(18,2), \overset{a_3}{C}(20,3), \overset{a_4}{D}(18,1), \overset{a_5}{E}(20,1), \overset{a_6}{F}(18,2) \}$$

Restricciones = $\{ f_i \neq f_{i+1} \text{ para } i \in \{1, 2, \dots, 5\} \}$

$$P_2 + P_4 \leq 4,$$

$$P_1 + P_5 \leq 4,$$

$P_3 + P_6 \leq 4$, todos distintos (x_1, \dots, x_6)

a) Forward Checking.

$A(20,1)$	$A(20,1)$	$A(20,1)$	$A(20,1)$	$A(20,1)$
$B(18,2)$	$B(18,2)$	$B(18,2)$	$B(18,2)$	$B(18,2)$
$C(20,3)$	$C(20,3)$	$C(20,3)$	$C(20,3)$	$C(20,3)$
$D(18,1)$	$D(18,1)$	$D(18,1)$	$D(18,1)$	$D(18,1)$
$E(20,1)$	$E(20,1)$	$E(20,1)$	$E(20,1)$	$E(20,1)$
$F(18,2)$	$F(18,2)$	$F(18,2)$	$F(18,2)$	$F(18,2)$

$A(20,1)$	$A(20,1)$	$A(20,1)$	$A(20,1)$	$A(20,1)$
$B(18,2)$	$B(18,2)$	$B(18,2)$	$B(18,2)$	$B(18,2)$
$C(20,3)$	$C(20,3)$	$C(20,3)$	$C(20,3)$	$C(20,3)$
$D(18,1)$	$D(18,1)$	$D(18,1)$	$D(18,1)$	$D(18,1)$
$E(20,1)$	$E(20,1)$	$E(20,1)$	$E(20,1)$	$E(20,1)$
$F(18,2)$	$F(18,2)$	$F(18,2)$	$F(18,2)$	$F(18,2)$

$A(20,1)$	$\cancel{A(20,1)}$	$\cancel{A(20,1)}$	$\cancel{A(20,1)}$	$\cancel{A(20,1)}$	$\cancel{A(20,1)}$
$B(18,2)$	$\cancel{B(18,2)}$	$\cancel{B(18,2)}$	$\cancel{B(18,2)}$	$\cancel{B(18,2)}$	$\cancel{B(18,2)}$
$C(20,3)$	$\cancel{C(20,3)}$	$\cancel{C(20,3)}$	$\cancel{C(20,3)}$	$\cancel{C(20,3)}$	$\cancel{C(20,3)}$
$D(18,1)$	$\cancel{D(18,1)}$	$\cancel{D(18,1)}$	$\cancel{D(18,1)}$	$\cancel{D(18,1)}$	$\cancel{D(18,1)}$
$E(20,1)$	$\cancel{E(20,1)}$	$\cancel{E(20,1)}$	$\cancel{E(20,1)}$	$\cancel{E(20,1)}$	$\cancel{E(20,1)}$
$F(18,2)$	$\cancel{F(18,2)}$	$\cancel{F(18,2)}$	$\cancel{F(18,2)}$	$\cancel{F(18,2)}$	$\cancel{F(18,2)}$

$A(20,1)$	$\cancel{A(20,1)}$	$\cancel{A(20,1)}$	$\cancel{A(20,1)}$	$\cancel{A(20,1)}$	$\cancel{A(20,1)}$
$B(18,2)$	$\cancel{B(18,2)}$	$\cancel{B(18,2)}$	$\cancel{B(18,2)}$	$\cancel{B(18,2)}$	$\cancel{B(18,2)}$
$C(20,3)$	$\cancel{C(20,3)}$	$\cancel{C(20,3)}$	$\cancel{C(20,3)}$	$\cancel{C(20,3)}$	$\cancel{C(20,3)}$
$D(18,1)$	$\cancel{D(18,1)}$	$\cancel{D(18,1)}$	$\cancel{D(18,1)}$	$\cancel{D(18,1)}$	$\cancel{D(18,1)}$
$E(20,1)$	$\cancel{E(20,1)}$	$\cancel{E(20,1)}$	$\cancel{E(20,1)}$	$\cancel{E(20,1)}$	$\cancel{E(20,1)}$
$F(18,2)$	$\cancel{F(18,2)}$	$\cancel{F(18,2)}$	$\cancel{F(18,2)}$	$\cancel{F(18,2)}$	$\cancel{F(18,2)}$

No hay opción para la antena 6.

6) Backtracking cronológico desde el corte en ③

