

1 E.A.5.3

1.1 Modellazione (Cards)

1.1.1 Variabili e domini

Dati i parametri $k, n \in \mathbb{N}$ t.c. $k \geq 2, n > 0$

$\text{CSP}(k \geq 2, n > 0) : (X, D, C)$

- $X = X_C \cup X_P$ t.c.
 - $X_C = \{C_i \mid i \in \{1, \dots, kn\}\}$
 - $X_P = \{P_i \mid i \in \{1, \dots, kn\}\}$
- $D = D_C \cup D_P$ t.c.
 - $D_C = \{D_{C_i} \mid \exists C_i \in X_C \wedge D_{C_i} = \{1, \dots, kn\}\}$
 - $D_P = \{D_{P_i} \mid \exists P_i \in X_P \wedge D_{P_i} = \{1, \dots, n\}\}$
- $C = C_{\text{cards}} \cup C_{\text{pos}} \cup \text{alldifferent}(P_1, \dots, P_n)$ t.c.
 - $C_{\text{cards}} = \{\langle \{C_i\}, R \rangle \mid \exists i, j\}$
 - $C_{\text{pos}} = \{\langle \{\}, R \rangle\}$

1.1.2 Vincoli

1.2 Istanziamento

1.2.1 Variabili e domini

Dati $k = 2, n = 4$

- $X = \{C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, P_1, P_2, P_3, P_4, P_5, P_6, P_7, P_8\}$
- $D = \{D_{C_1}, D_{C_2}, D_{C_3}, D_{C_4}, D_{C_5}, D_{C_6}, D_{C_7}, D_{C_8}, \}$

1.2.2 Vincoli

- $C = C_{\text{diff}} \cup C_{\text{col}} \cup C_{\text{pos}}$
- $C_{\text{diff}} = \text{alldifferent}(P_1, P_2, P_3, P_4, P_5, P_6, P_7, P_8)$
- $C_{\text{col}} = \{\}$
- $C_{\text{pos}} = \{\}$

1.3 Codifica in MiniZinc

```
include "alldifferent.mzn";

int: k = 3;
int: n = 10;

array[1..k * n] of var 1..n: cards;
array[1..k * n] of var 1..k * n: positions;

constraint forall(i in 1..n, j in 1..k)(
    cards[(i - 1) * k + j] == i
);

constraint forall(i in 0..n - 1, j in 2..k)(
    positions[i * k + j] ==
        positions[i * k + j - 1] + cards[i * k + j] + 1
);

constraint alldifferent(positions);
```