

The slide features abstract green geometric shapes. On the left, a solid green triangle points downwards. On the right, a complex arrangement of overlapping translucent green triangles and polygons creates a layered, geometric effect. A thin, light gray line extends from the bottom left towards the right side of the slide, passing behind the text.

Examples of Constraint Satisfaction Problems (CSP)

Sudoku

	6		4		3	8		7
					2	4		
	3				8			5
				4	1			8
1	2		9		7		5	6
8			3	5				
2			6				3	
		3	7					
9		1	8		4		6	

Sudoku CSP

- ▶ variables:
- ▶ domains:
- ▶ constraints:



Sudoku CSP

- ▶ **variables:** X_{11}, \dots, X_{99}
- ▶ **domains:** $\{1, \dots, 9\}$
- ▶ **constraints:**
 - ▶ **Rows:** $X_{11} \neq X_{12}, \dots, X_{11} \neq X_{19}$
 - ▶ **Columns:** $X_{11} \neq X_{12}, \dots, X_{11} \neq X_{19}$
 - ▶ **Blocks:** $X_{11} \neq X_{12}, \dots, X_{11} \neq X_{33}$

Crossword:

1		2		3
	4		5	
6		7		
8				

List of valid words

aft laser
ale lee
eel line
heel sails
hike sheet
hoses steer
keel tie
knot

Solution of this CSP

¹ h	o	² s	e	³ s
		a		t
	⁴ h	i	⁵ k	e
⁶ a		⁷ l	e	e
⁸ l	a	s	e	r
e			l	

Variable and domains

- ▶ 8 variables (one for each word)
- ▶ Domains = palabras válidas

1		2		3
	4		5	
6		7		
8				

LISTA

aft laser
ale lee
eel line
heel sails
hike sheet
hoses steer
keel tie
knot

$D_{x1} = D_{x2} = D_{x3} = D_{x8} = \{\text{hoses, laser, sails, sheet, steer}\}$

$D_{x4} = D_{x5} = \{\text{heel, hike, keel, knot, line}\}$

$D_{x6} = D_{x7} = \{\text{aft, ale, eel, lee, tie}\}$

Constraints

1		2		3
	4		5	
6		7		
8				

same(3,x1,1,x2)
same(5,x1,1,x3)
same(3,x2,2,x4)
same(4,x2,1,x7)
same(5,x2,3,x8)
same(3,x3,4,x4)
same(4,x3,3,x7)
same(5,x3,5,x8)
same(3,x4,1,x5)
same(2,x5,2,x7)
same(3,x5,4,x8)
same(2,x6,1,x8)