AI Theory

Review

Factor graph vs CSP

⇒ extending partial assignment
↳ all variables have been assigned a value, matter.

Dependent factors:

$D(X, X_i)$

Set of factors dependy on X_i but not X

Backtrack search $\left(\begin{matrix} x, w, \\ \text{domain} \end{matrix}\right)$:

→ if x is complete, return best- after updating

→ choose assigned variable

→ Order <u>value</u> of domain

$$S = \pi f_i(x, x_i)$$

if $f == 0$, fail

update domain

Backtrack —

Lookahead = forward check

At each step, update itself and update domains.

(One step lookahead)

Least constraint value

Select that domain that have more consistent values.

↓

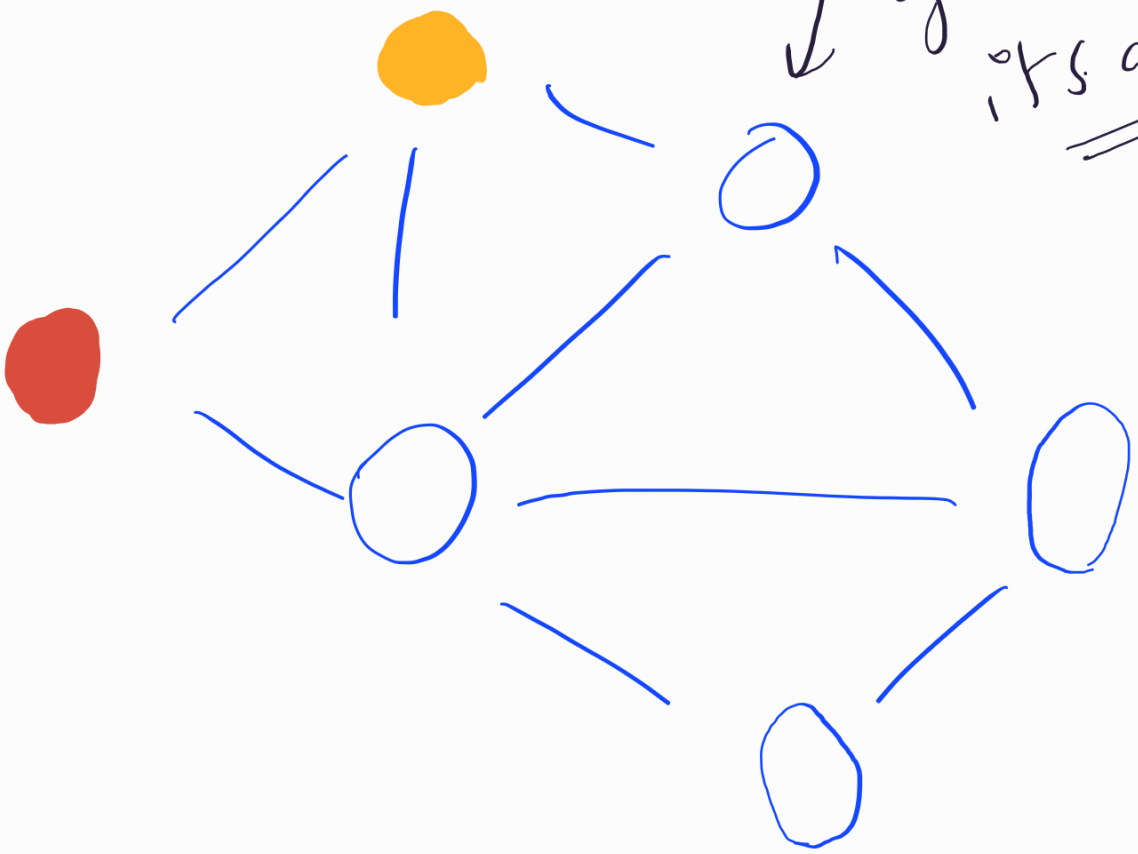
less constraints

Arc consistency:

↳ Domain updation way earlier

Basically:

this one eliminate green from its domain



Algo:

→ Add X_j to set:

While set:

↳ remove an element from set.

↳ If that domain updates, add it to the set. Add neighbours to the set too.

Example:

$$X_i \in D_i = \{1, 2, 3, 4, 5\}$$

$$X_j \in D_j = \{1, 2\}$$

$$f_1(x) = \{X_i + X_j = 4\}$$

enforce arc consistency on X_i.

1	1
2	2
3	
~~4~~	
~~5~~	

1, 1 = X

2, 2 = ✓

3, 1 = ✓

So Arc Consistency

$\Rightarrow \{2, 3\}$

Only choose those values whose scope contains both x_i & x_j in its binary form.

Basically a new style of forward checking.

↳ AC3 Algs

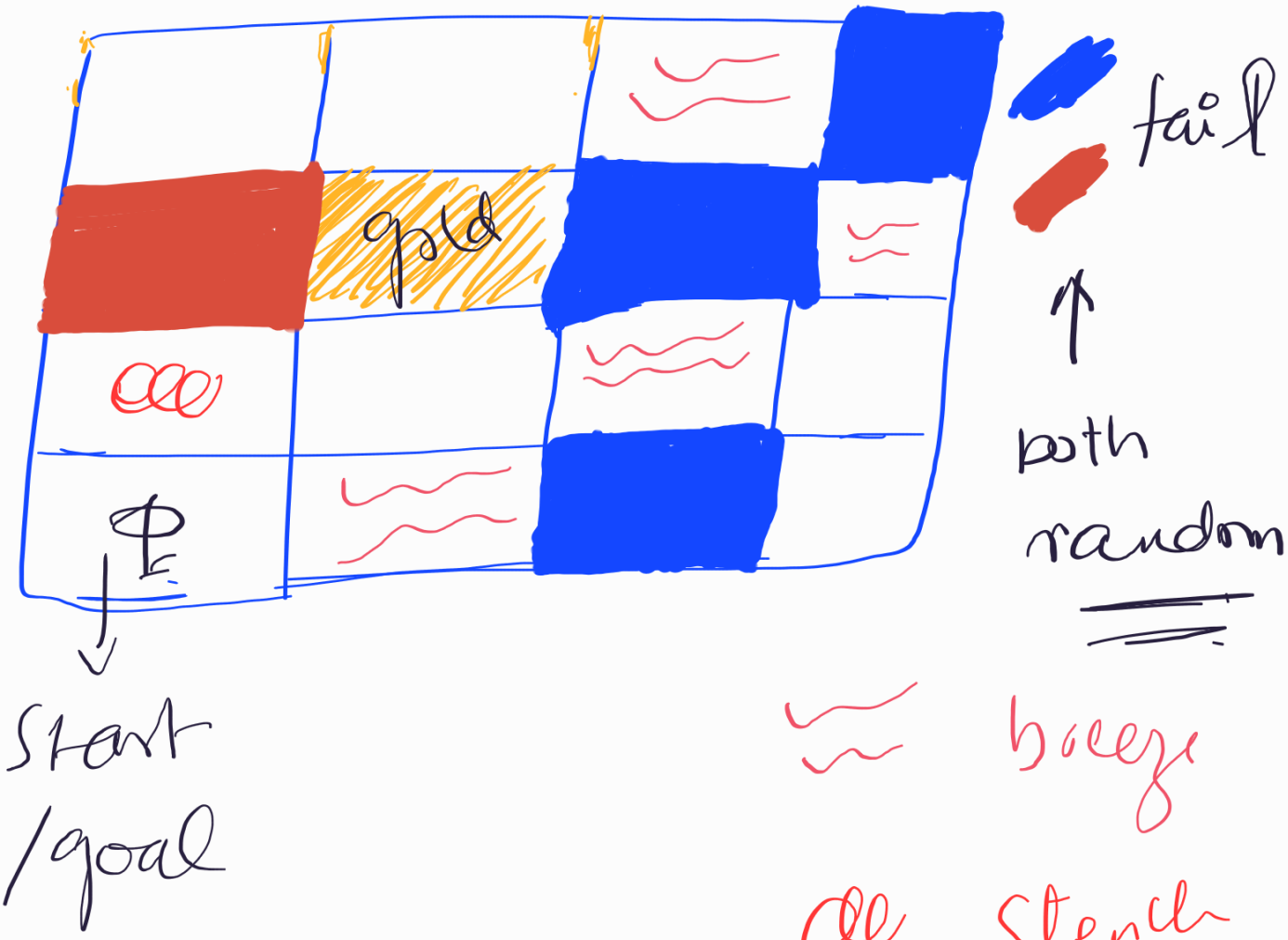
Logical Agent

Propositional Logic

↓

First Order Logic

Wumpus world env.



→ just one arrow to kill the wumpus (red square) then the red square is safe.

P performance measure = +1000
arrow use = -10

E environment: grid

A actuator: Left/Right
shoot
climb

S sensors:

breeze
stench
glitter (glow)
bump
scream