

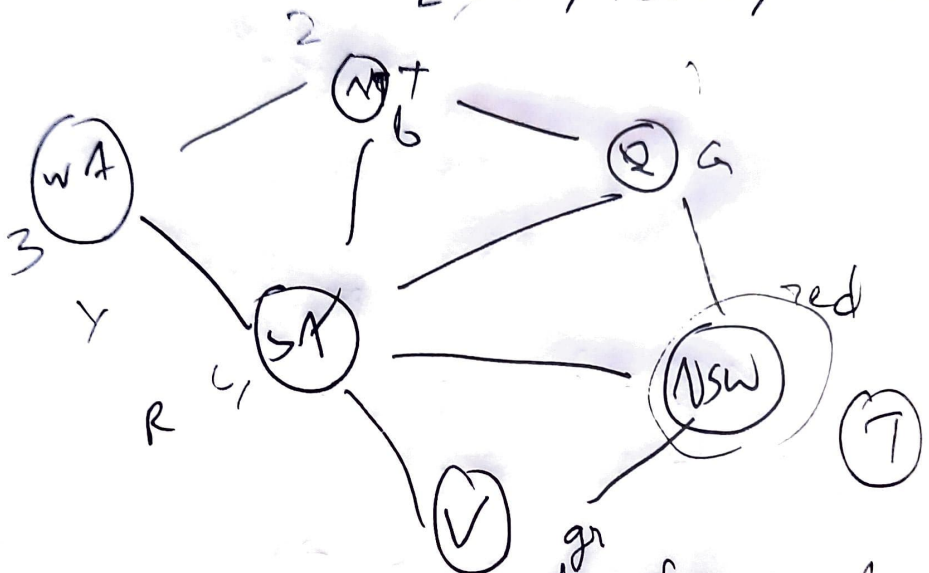
18B C5014

Asutosh
Ghanta

AI Assignment -mc

① i) If 4 colors are allowed

variable : { NT, NSW, T, SA, V, WA }
domain = { red, yellow, blue, green }



suppose coloring starts from SA:-

SA	WA	NT
↓	↓	↓
4	3	2

others have
1 choice

$$4 \times 3 \times 2 = 24$$

since ~~that is main~~ Tasmania
isn't connected

$$= 24 \times 4 = \underline{96}$$

ii) If 2 colors are allowed
not possible to color
the map.

(2): variables = {Teachers, subjects,
classroom, time slots}

let T_{ij} and S_{ij} be two
constraint in matrix

$T_{ij} \rightarrow$ teacher in classroom i at
time j

$S_{ij} \rightarrow$ class i at time j
which subject taught.

$T_{ij} \rightarrow \{\text{Teachers}\}$
 $S_{ij} \rightarrow \{\text{Students}\}$ } domain

let $D(t)$ denote set of subjects
teacher can teach

constraints:- $T_{ij} \neq T_{kj} \quad k \neq j$

which enforces that a teacher
doesn't teach diff class at
same time.

Another constraint:-

$$c(T_{ij}, S_{ij}) = \{ (t, s) \mid \text{teacher can teach subject } s \}$$

That ensures that if teacher t is assigned to T_{ij} , then S_{ij} is assigned a value from $p(t)$.

Hamiltonian tour:-

Let n cities

variables = { set of n cities }

domain = $\{ 1, 2, \dots, n \}$

constraint:- All different (set of n cities)

each variable (city) would be assigned one index in the path, so that each city is traversed once.

④ most constrained variable
because such variable is
likely to cause failures
and it easy to detect failures
as early as possible

⑤ worst case time
complexity AC-3
algo is $O(ED^3)$

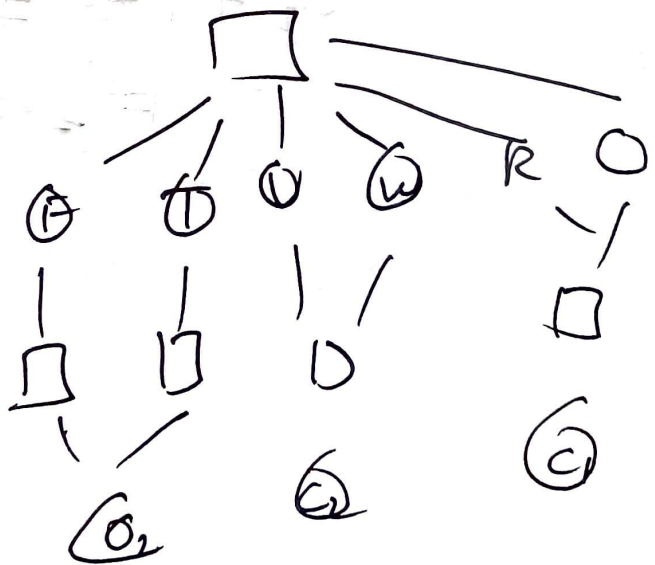
E = num of arcs

D = size of largest
domain

③ TWO
+ TWO
Four

variable
 $\{0 \dots 9\}$
carry
digits

domain = $\{0, 1\}$



All diff constraint says that all variables involve must have different value.

MRV to choose the variable and LCV heuristic to assign values to the chosen variable

The constraints are:-

$$O + O = R + 10 \times C_1$$

$$C_1 + W + W = V + 10 \times C_2$$

$$C_2 + T + T = O + 10 \times C_3$$

$$F = C_3$$