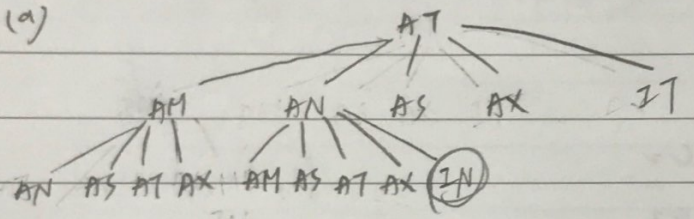
0616206
吳翔潔

No.
Date : :

#1. Robot Mouse Races
- P: 移動(找終點)
- E: 迷宮
- A: 馬達
- S: 牆壁的感知

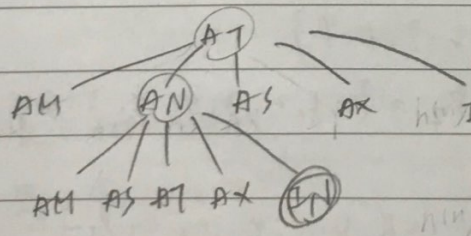
Robothespian
- P: 唱歌、說話、動作表達
- E: 公共場所
- A: 顯示螢幕、喇叭、能操控的手臂
- S: 聲音接收器

#2. (a)



(b) 因為一次替換一個letter，所以用Hamming distance先找出差距最少的，就能以最少的替換次數，達到結果(final state)

(c)



#3. ① $x=\{0,1,*,*,*,*,*,*,*,*\}$

$y=\{0,1,2,3,*,*,*,*,*,*\}$

$z=\{0,1,*,*,*,*,*,*,*,*\}$

Agenda

~~$x=y^2$~~

~~$y^2=z$~~

~~$x=z^3$~~

~~$z^3=x$~~

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⑧ $X=\{0,1\}$ Agenda

$Y=\{0,1,\star,*\}$ ~~$X=Y^2$~~

$Z=\{0,1\}$ ~~$Y^2=\star$~~

~~$\star=E^3$~~

~~$X=Y^2$~~

$\Rightarrow X=\{0,1\}$ 、$Y=\{0,1\}$ 、$Z=\{0,1\}$ #

#4. (a) ⊙ Alldiff(E, F, I, N, O, R, U, V)

② $F\neq 0$, $O\neq 0$

① $R+E = E+10\cdot C_1$

④ $C_1+U+N = V+10\cdot C_2$

⑤ $C_2+O+O = I+10\cdot C_3$

⑥ $C_3+F = F$

(b) $D_{C_3}=\{0\}$

$D_{C_1}=D_{C_2}=\{0,1\}$

$D_F=D_O=\{1,2,3,4,5,6,7,8,9\}$

$D_R=D_E=D_U=D_N=D_V=D_I=\{0,1,2,3,4,5,6,7,8,9\}$

Node	State(E, F, I, N, O, R, U, V, C_1, C_2, C_3)	Action
0	(-, -, -, -, -, -, -, -, -, -, -)	Select C_3 by MRV
1	(-, -, -, -, -, -, -, -, -, -, 0)	Assign $C_3=0$

$D_{C_1}=D_{C_2}=\{0,1\}$ Remove $\{5,6,7,8,9\}$

$D_O=\{1,2,3,4\}$ from D_O, Select

$D_F=\{1,2,3,4,5,6,7,8,9\}$ C_1 by MRV

$D_R=D_E=D_U=D_N=D_V=D_I=\{0,1,2,3,4,5,6,7,8,9\}$

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2 (-,-,-,-,-,-,-,-,0,-,0) Assign $c_1=0$ by LCV.

Remove [1,2,3,4,5,6,7,8,9] from D_R. Select R by MRV

$D_{c_2} = [0,1]$

$D_R = [0]$

$D_O = [1,2,3,4]$

$D_T = [1,2,3,4,5,6,7,8,9]$

$D_E = D_O = D_N = D_V = D_I = [0,1,2,3,4,5,6,7,8,9]$

3 (-,-,-,-,-,0,-,-,0,-,0) Assign R=0 by LCV.

Remove [0] from all.

Select c_2 by MRV

$D_{c_2} = [0,1]$

$D_O = [1,2,3,4]$

$D_T = D_E = D_O = D_N = D_V = D_I = [1,2,3,4,5,6,7,8,9]$

4 (-,-,-,-,-,0,-,-,0,0,0) Assign $c_2=0$ by LCV.

Remove [1,3,5,7,9] from D_I, and [5,6,7,8,9] from D_O, D_N. Select O

$D_O = [1,2,3,4]$

$D_I = [2,4,6,8]$

$D_U = D_N = [1,2,3,4]$

$D_V = D_T = D_E = [1,2,3,4,5,6,7,8,9]$

5 (-,-,-,-,1,0,-,-,0,0,0) Assign D=1 by LCV.

Remove [1] from all, [4,6,8] from D_I, Select I by MRV

$D_O = D_N = [2,3,4]$

$D_I = [2]$

$D_V = D_T = D_E = [2,3,4,5,6,7,8,9]$

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6 (-,-,2,-,1,0,-,-,0,0,0) Assign I=2 by LCV, Remove [2] from all, Select U by MRV

$D_U = D_N = [3,4]$

$D_V = D_F = D_E = [3,4,5,6,7,8,9]$

7. (-,-,2,-,1,0,3,-,0,0,0) Assign U=3 by LCV. Remove [3] from all. Select N by MRV.

$D_N = [4]$

$D_V = D_F = D_E = [4,5,6,7,8,9]$

8 (-,-,2,4,1,0,3,-,0,0,0) Assign N=4 by LCV. Remove [4] from all, [5,6,8,9] from D_V, Select V by MRV

$D_V = [7]$

$D_F = D_E = [5,6,7,8,9]$

9 (-,-,2,4,1,0,3,7,0,0,0) Assign V=7 by LCV, Remove [7] from all. Select F by MRV

$D_F = D_E = [5,6,8,9]$

10 (5,-,2,4,1,0,3,7,0,0,0) Assign F=5 by LCV. Remove [5] from all, Select E by MRV

$D_E = [6,8,9]$

11 (5,6,2,4,1,0,3,7,0,0,0) Assign E=6

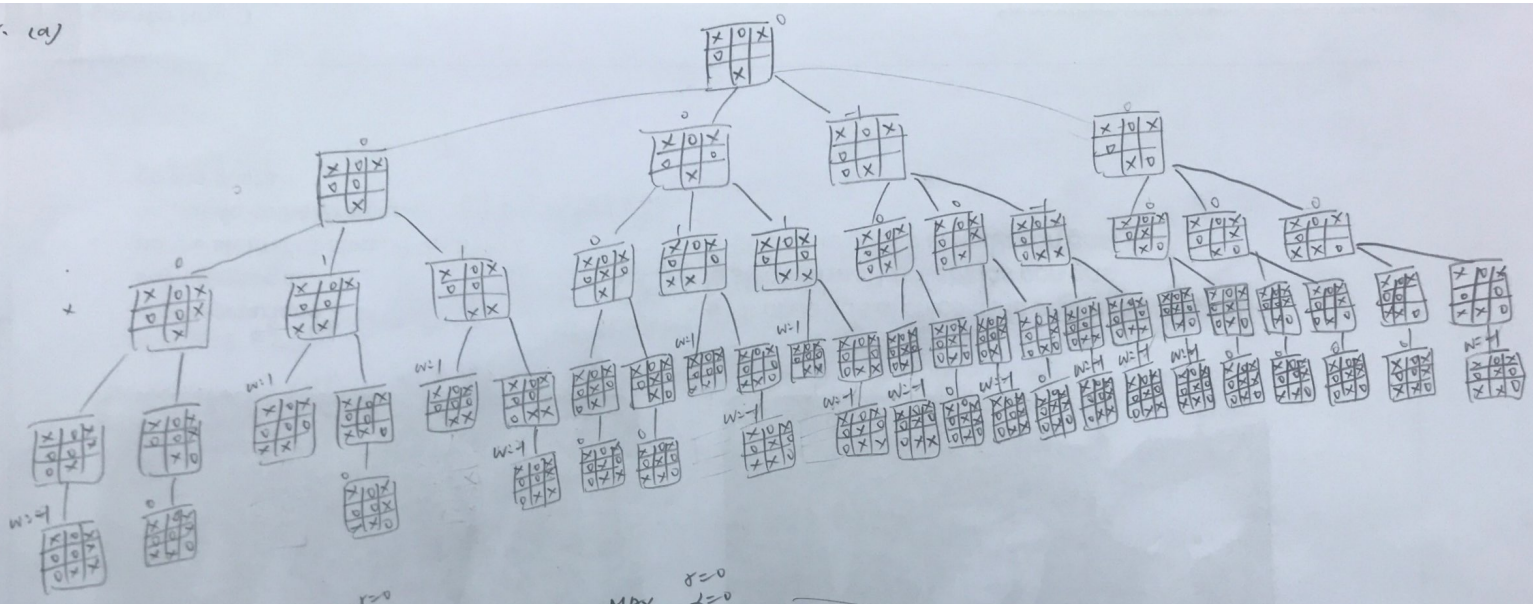
⇒ 5 2 7 6

−) 5 1 3 0

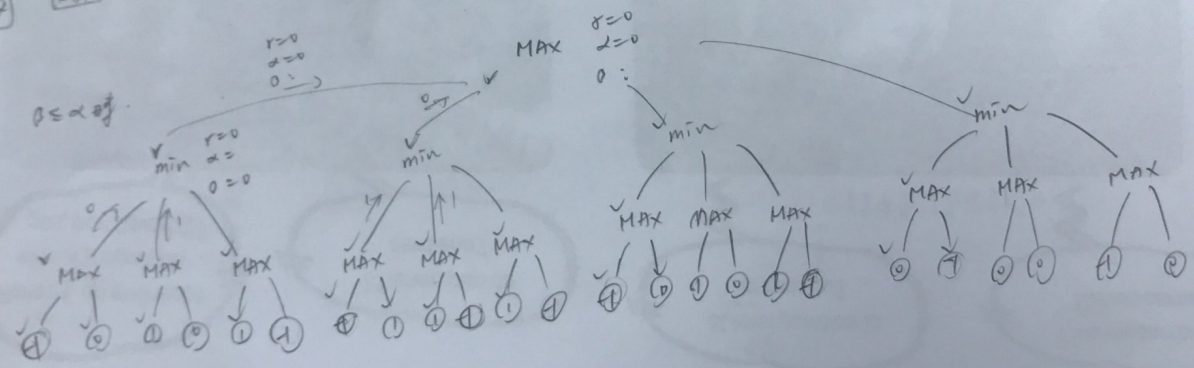
1 4 6 #

Chuyo culture

5. (a)



(b) $\beta \le \alpha$ 時



→ check 的 node 共 39 個

6. (a)

A的 CNF : A —①

B的 CNF : B —②

P ⇒ Q 的 CNF : ¬P∨Q —③

L∧M ⇒ P的 CNF : ¬(L∧M)∨P → (¬L∨¬M)∨P → ¬L∨¬M∨P —④

L∧B ⇒ M的 CNF : ¬(L∧B)∨M → (¬L∨¬B)∨L → ¬L∨¬B∨L —⑤

A∧B ⇒ L的 CNF : ¬(A∧B)∨L → (¬A∨¬B)∨L → ¬L∨¬B∨L —⑥

A∧B ⇒ L的 CNF : ¬(A∧P)∨L → (¬A∨¬P)∨L → ¬A∨¬P∨L —⑦

(b)

Step	CNF	Derivation
1	A	given
2	B	given
3	¬P∨Q	converted
4	¬L∨¬M∨P	converted
5	¬L∨¬B∨M	converted
6	¬A∨¬B∨L	converted
7	¬A∨¬P∨L	converted
8	¬Q	Negated conclusion
9	¬B∨L	1, 6
10	¬P∨L	1, 7
11	¬L∨M	2, 5
12	¬A∨L	2, 6
13	L	1, 12
14	M	11, 13
15	¬M∨P	4, 13
16	P	14, 15
17	Q	3, 16
18	[ ]	8, 17 → Q is proved