Assignment - 2

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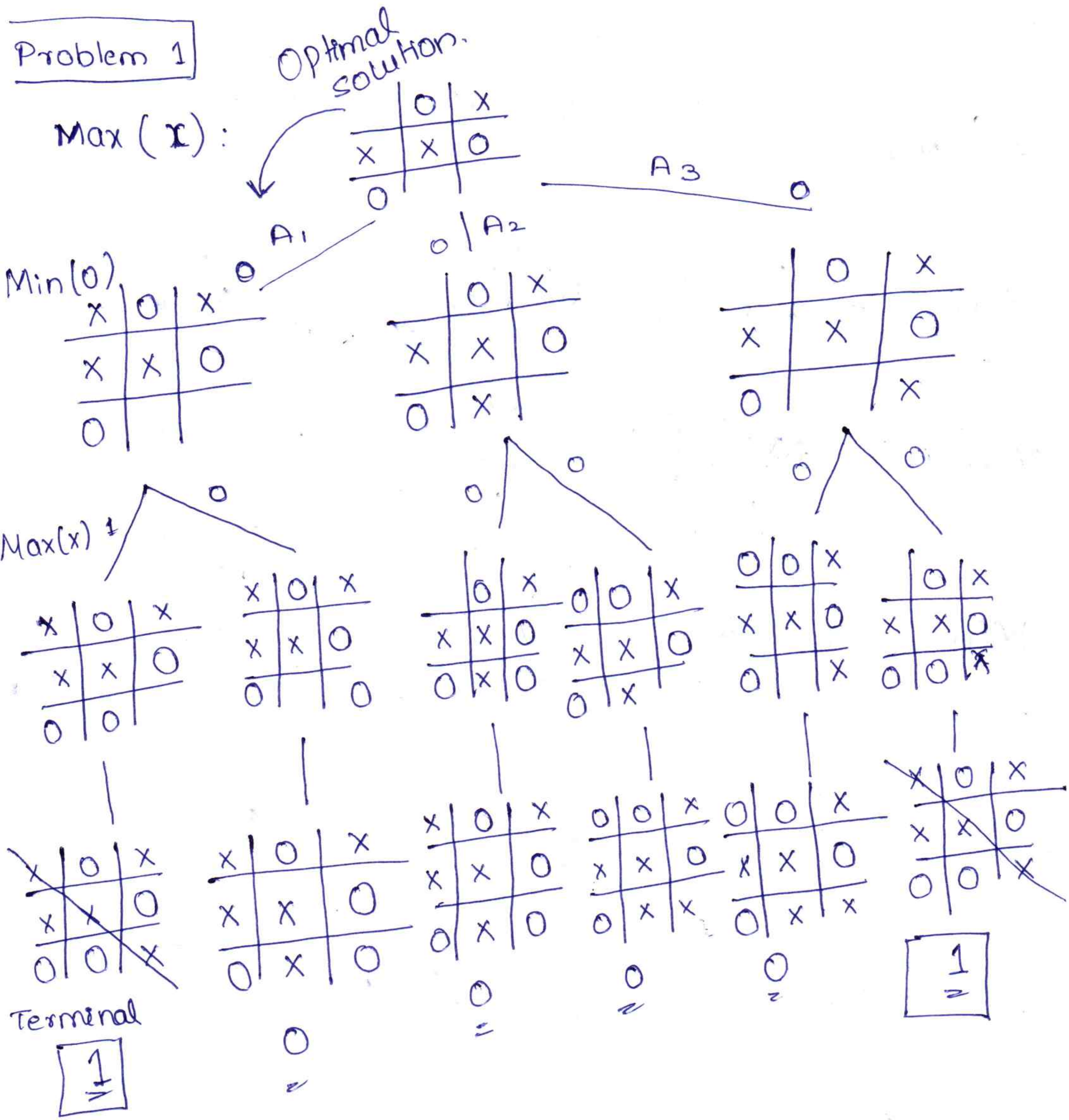
Problem 1



Optimal solution for the max player would be A1 or the left most move.

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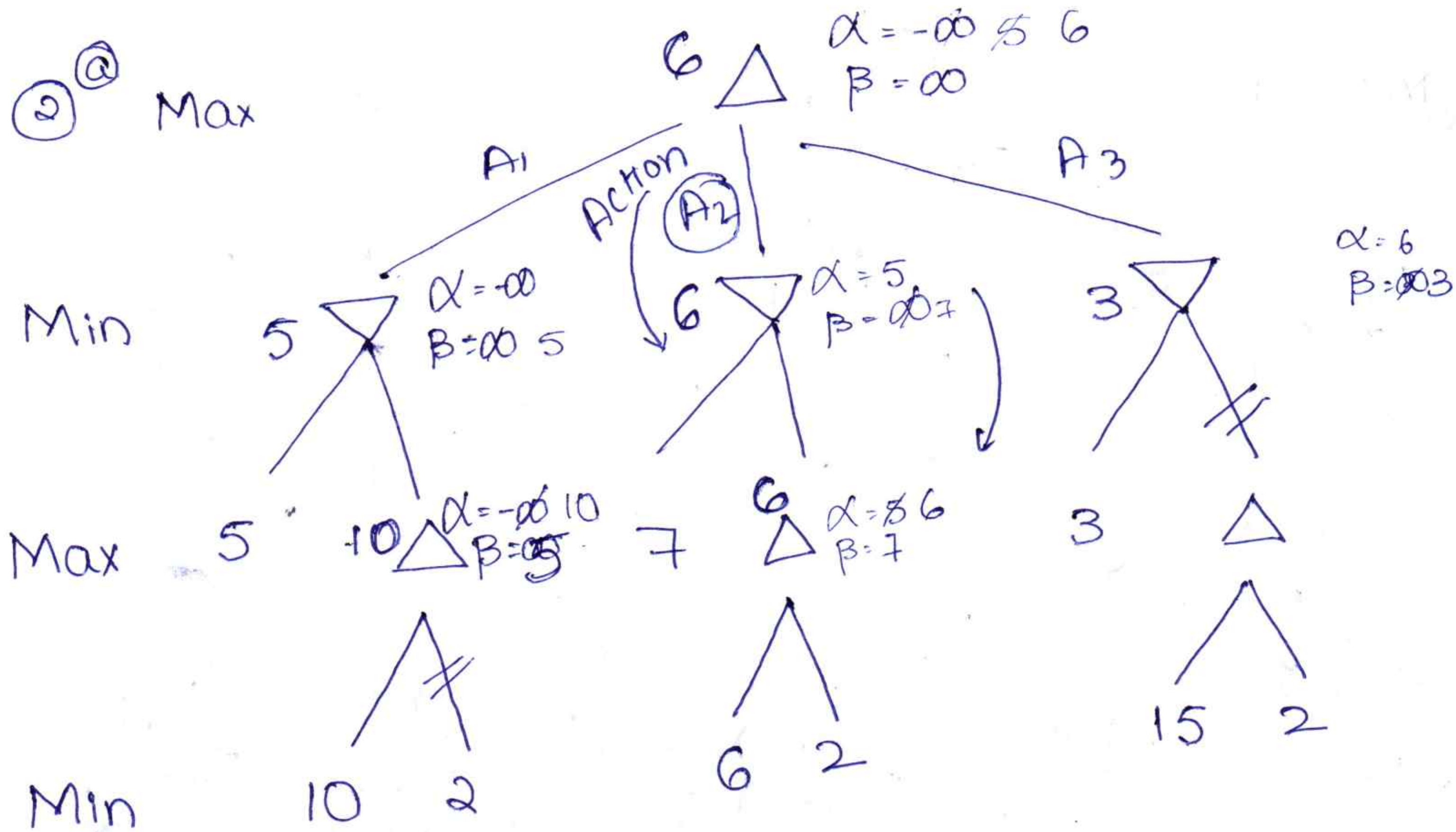
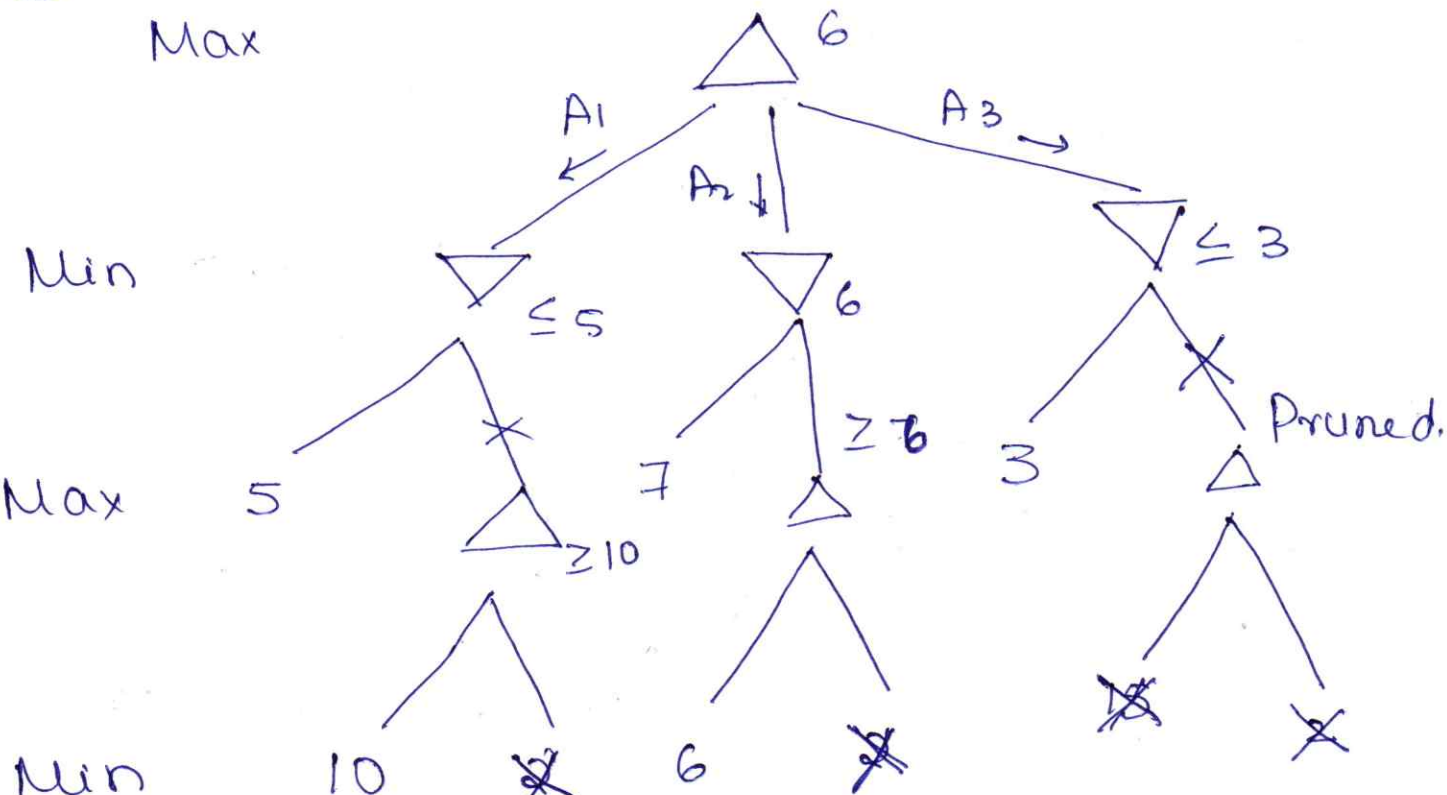
(2) (a)



optimal solution will be A2.

(b)



Since Max utility = 15 & Min = 2., α-β pruning will be same as before.

2c) <u>Optimal</u>

Max payoff = 6

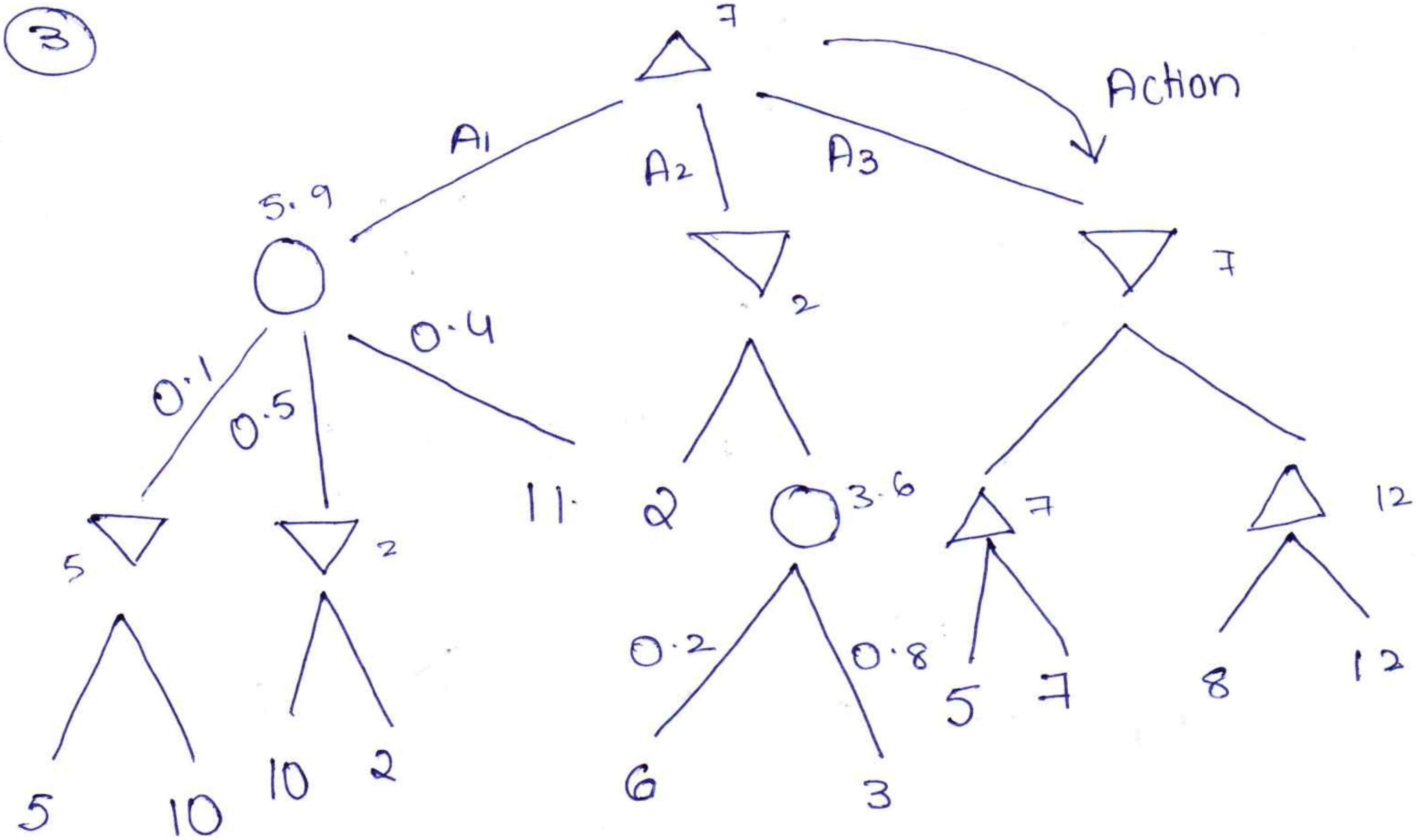
Min payoff = 6

<u>Random Strategy</u>

Max payoff = 7

Min payoff = 6.

(3)



- Action A_3 will be performed
- Minmax value obtained at the root node represents expected payoff against an optimal oponenet.

The Max can be = 7

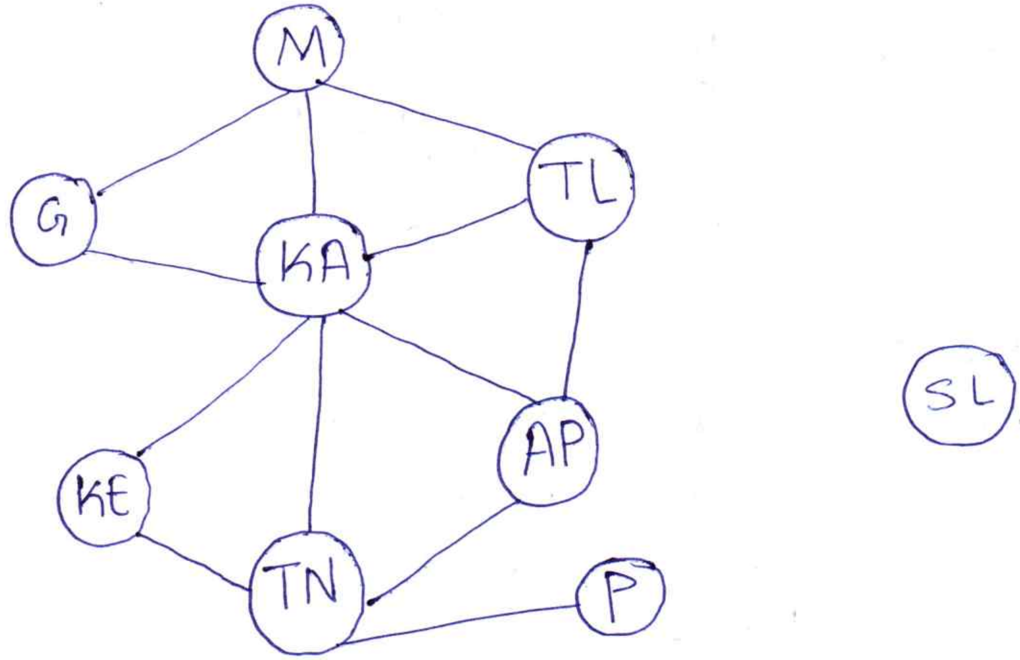
The Min can be = 7

If opponent uses random stratergy.

Max payoff = 12

Min payoff = 7

4) (a)



Variables = M, G, KA, TL, AP, TN, G, KE, P, SL

Domains = {Red, Green, Blue}

Constrain = No two section sharing a border will have same color

Yes, this information can be used to simplify the problem. We can use MRV value & node of each degree to get degree heuristic.

(b) Start with KA {Red, Green, Blue}

KA → red

MRV:

M = 2 TN = 2

G = 2 P = 3

TL = 2

AP = 2 SL = 3

KE = 2

Degree Value: M = 2   TN = 3
G = 1   KE = 1
TL = 2   P = 1
AP = 2   S = 0

(2) TN = Green

MRV = M = 2   KE = 1
G = 2   P = 2
TL = 2   SL = 3
AP = 1

DEGREE Value.
M = 2   KE = 0
G = 1   P = 0
TL = 2   SL = 0
AP = 1

(3) AP = blue

MRV = M = 2   P = 2
G = 2   SL = 3
TL = 1
KE = 1

DV: M = 2   P = 0
G = 1   SL = 0
TL = 1
K = 0

(4) TL = Green

MRV = M = 1   P = 2
G = 2   SL = 3
KE = 1

Degree Value : M = 1   P = 0

~~Na~~ ~~=d~~ G = 2   SL = 0

KE = 0

(5) M = blue

MRV = G = 1   P = 2

KE = 1   SL = 3

Degree Value = G = 0   P = 0

KE = 0   SL = 0

(6) ~~Mary~~ G = Green

MRV = KE = 1

P = 2

SL = 3

DEGREE Value =

KE = 0

P = 0

SL = 0

(7) KE = Blue

MRV = P = 2

SL = 3

Degree Value P = 0

SL = 0

(8) P = Red

MRV = SL = 3

Degree Value SL = 0.

(9) SL = Blue

ⓒ

	M	G	TL	KA	AP	KE	TN	P	SL
KA = red	rgb	rgb	rgb	R	rgb	rgb	rgb	rgb	rgb
TN = green	rgb	rgb	rgb	R	rgb	rgb	g	rgb	rgb
AP = blue	rgb	rgb	rgb	R	blue	rgb	g	rgb	rgb
TL = green	rgb	rgb	g	R	b	rgb	g	rgb	rgb
M = blue	b	rgb	g	r	b	rgb	g	rgb	rgb
G = green	b	g	g	r	b	rgb	g	rgb	rgb
KE = blue	b	g	g	r	b	b	g	rgb	rgb
P = red	b	g	g	r	b	b	g	r	rgb
SL = blue	b	g	g	r	b	b	g	r	b

M	KA	TN	AP	TL	G	KE	P	SL
B	R	G	B	G	G	B	R	B

ⓓ M = red, KA = green, TL = blue, AP = red,
TN = blue, G = blue, KE = RED, P = red.
SL = red

M	KA	TL	AP	TN	G	KE	P	SL
R	G	B	R	B	B	R	R	R

⑤ algorithm pseudocode

function min-value(s) then return utility
if terminal test (s) then return
utility(s)
return Max-value (Deep Green move(s))

If the deep green move pick the optimal straterg strategy then this algorithm will return the exact strategy as min-max & have same payoff

If deep Green move in sub optimal then it is possible for this Version to get better result

Min Max explore all node where as using deep green node (s) will give optimal solution.