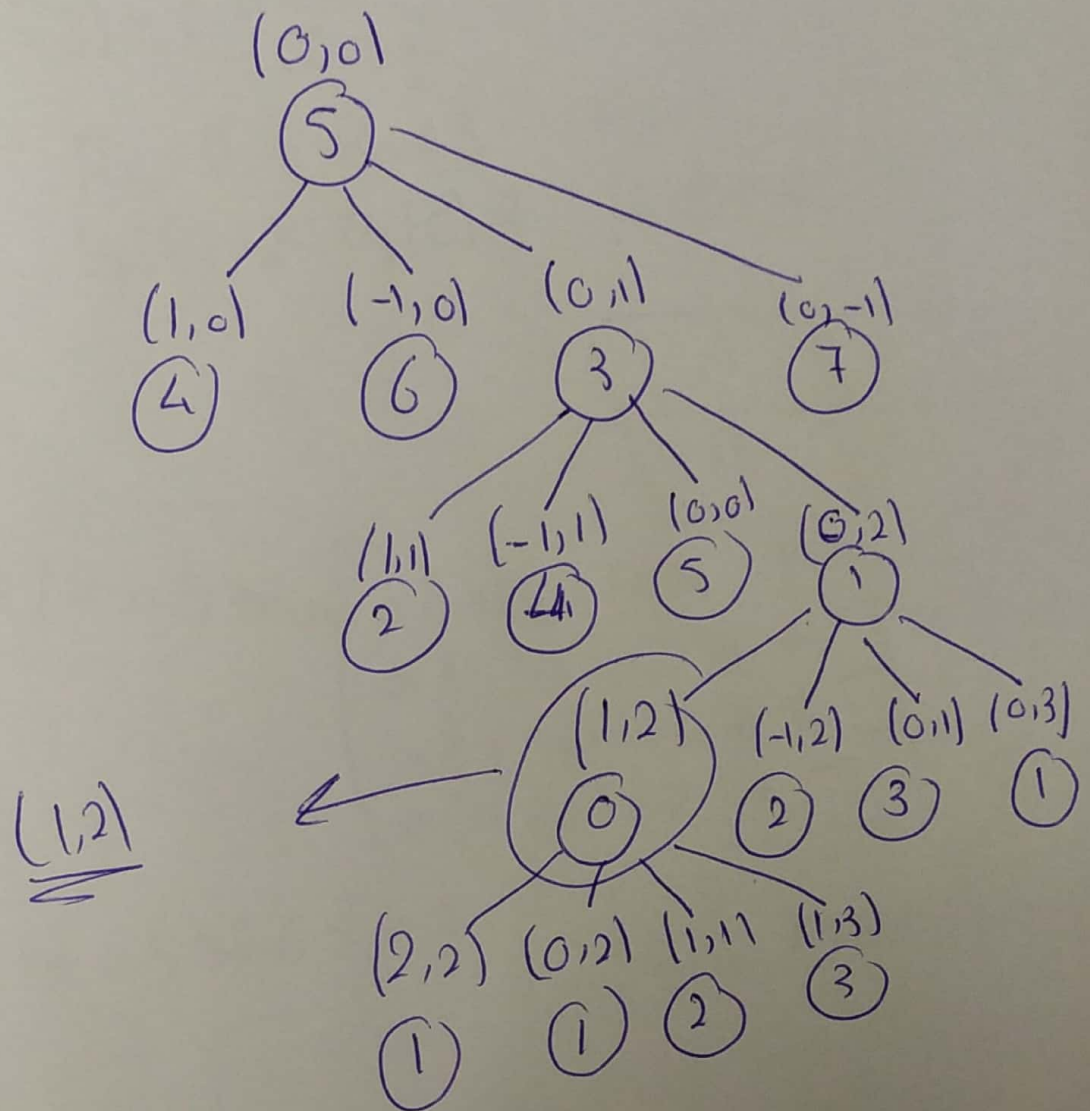


$$\boxed{1} \quad |X+2| - 5$$



(ii) 5

(iii)  $(4,0) \leadsto 1$        $(5,0) \leadsto 0$

$$\Delta E = -1$$

$$e^{\frac{\Delta E}{T}} = e^{-1/4}$$

~~$e^{\frac{\Delta E}{T}} = e^{-1/4}$~~

Mini Mize  
 $\hookrightarrow p = 1$

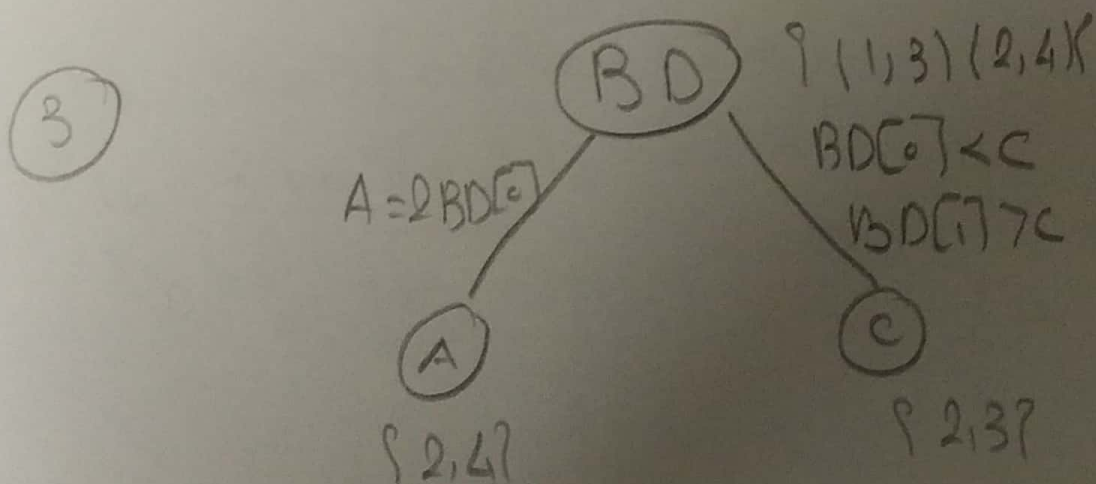
A	<del>1</del> <sub>1</sub>	2	<del>3</del> <sub>1</sub>	4	<del>5</del> <sub>1</sub>
B	1	2	<del>3</del> <sub>2</sub>	<del>4</del> <sub>2</sub>	<del>5</del> <sub>2</sub>
C	<del>1</del> <sub>4</sub>	2	3	<del>4</del> <sub>7</sub>	<del>5</del> <sub>7</sub>
D	<del>1</del> <sub>6</sub>	<del>2</del> <sub>6</sub>	3	4	<del>5</del> <sub>6</sub>

① ~~(A, B)~~<sup>1</sup> ~~(B, A)~~<sup>2</sup> ~~(B, C)~~<sup>3</sup> ~~(C, B)~~<sup>4</sup> ~~(B, D)~~<sup>5</sup> ~~(D, B)~~<sup>6</sup>  
~~(C, D)~~<sup>7</sup> ~~(D, C)~~<sup>8</sup> ~~(A, B)~~<sup>9</sup> ~~(B, C)~~<sup>10</sup> ~~(B, D)~~<sup>11</sup>

A = {2, 4} B = {1, 2} C = {2, 3} D = {3, 4}

2 1 2 3 ✓ 4 2 3 4 ✓

② Yes it is 1-consis. for sat. unary Cons.



! {2, 3, 4} = {2, 4}

Q<sub>1</sub> BFS Graph

Explored  
S A B C D E F G

Path S A C E G

S  
B A  
C B  
E  
E D  
G F E  
G F  
G

Q<sub>2</sub> DFS Graph

Explored  
S A C D F G

Path  
S A C D F G

G F D E C A B S  
S

Q<sub>3</sub>

Explored  
S A B C D F ~~E~~ G

Path  
S A C D F G

Q<sub>4</sub>

Explored  
S A C E G

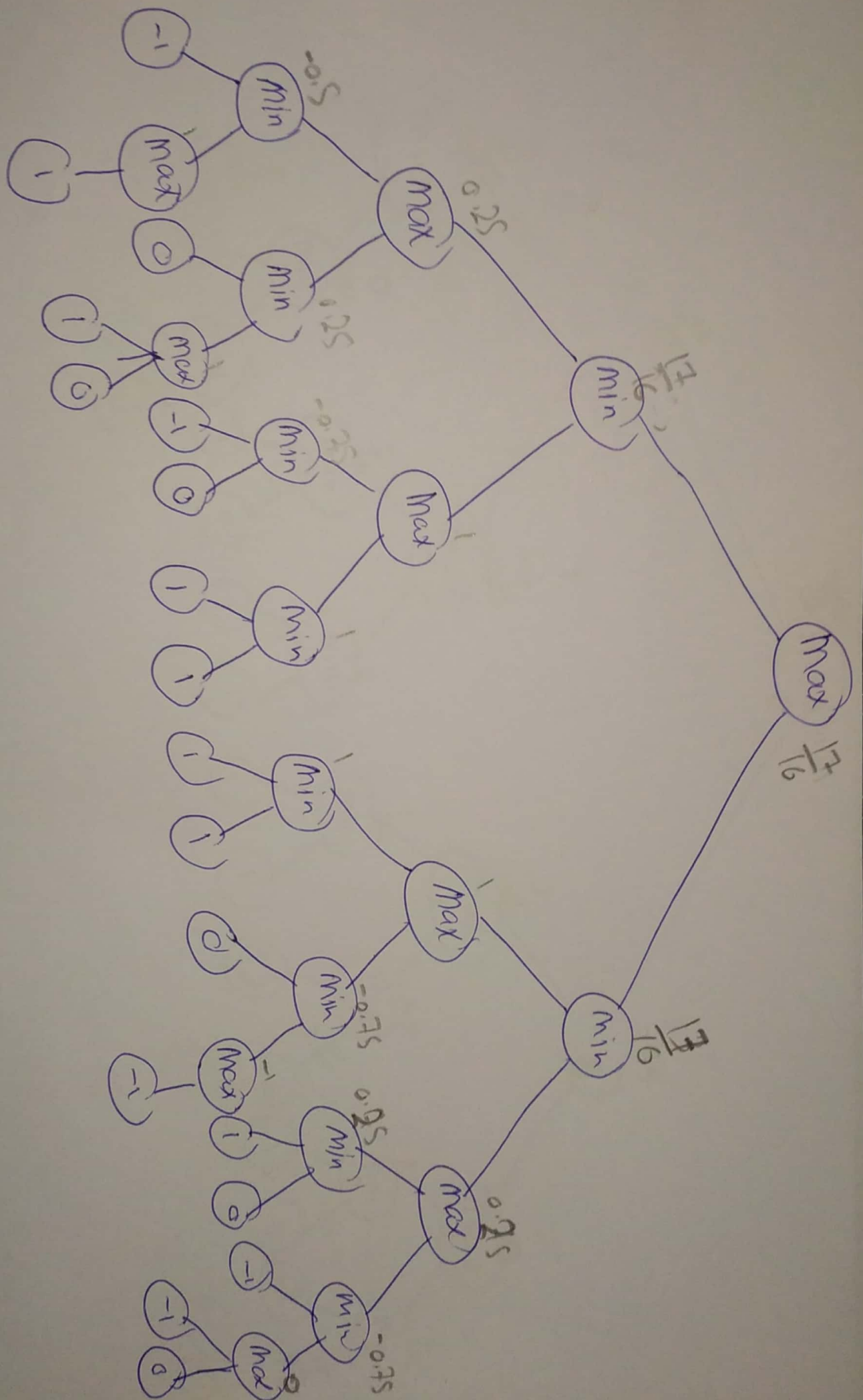
Path  
S A C E G

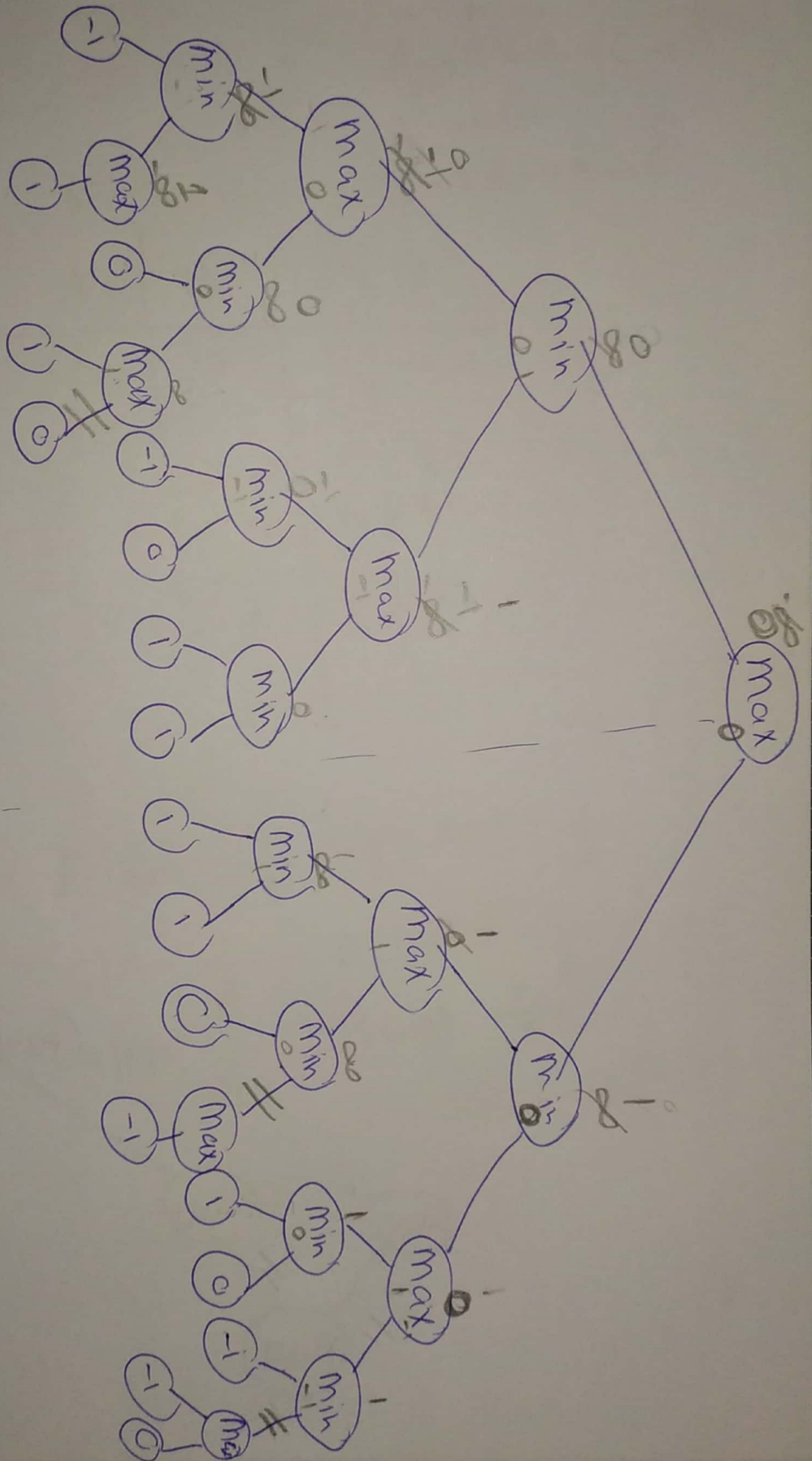
Q<sub>5</sub>

Explored: S A C D F ~~E~~ G

Path: S A C D F G







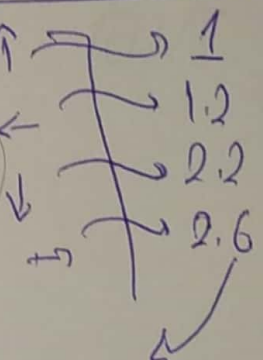
# MDP

$$U(S) = R(S) + \gamma \max_a \sum_{S'} P(S'|S, a) U(S')$$

$$\begin{array}{cccc} R_A = 1 & R_B = 2 & R_C = 3 & R_D = 4 \\ U_1(A) = 1 & U_2(B) = 2 & U_3(C) = 3 & U_4(D) = 4 \end{array}$$

1	A	3	C
2	B	4	D

Q1

$$U_2(A) = 1 + 0.5 \max \begin{cases} 0.8 \times V_A + 0.2 V_A \\ 0.8 \times V_A + 0.2 V_B \\ 0.8 \times V_B + 0.2 V_C \\ 0.8 \times V_C + 0.2 V_A \end{cases}$$


$$= 1 + 0.5 \times 2.6 = 2.3$$

Q3 Move Right

Q2

$$V_A = 1 + 0.5 [0.8 V_C + 0.2 V_A]$$

$$V_B = 2 + 0.5 [0.8 V_B + 0.2 V_D]$$

$$V_C = 3 + 0.5 [0.8 V_C + 0.2 V_A]$$

$$V_D = 4$$

$$\boxed{V_B = 4}$$

$$0.1 V_A - 0.6 V_C = 3$$

$$-0.9 V_A + 0.4 V_C = -1$$

$$\boxed{V_A = 3.6} \quad \boxed{V_C = 5.6}$$

## Direct Utility Estimation

A	B	C	D
2.875 0.875	1.875	<del>0.875</del> 0.25	0.25
1.5	1	5 4.5	2 0.5
1.75	1.4375	3.375	0.91667



Q2  $P(B|A) = \frac{2}{3}$   $P(A|B) = \frac{1}{2}$

$$P(C|A) = \frac{1}{3}$$

$$P(D|C) = \frac{2}{3}$$

$$P(A|C) = \frac{1}{3}$$

$$P(D|B) = \frac{1}{2}$$

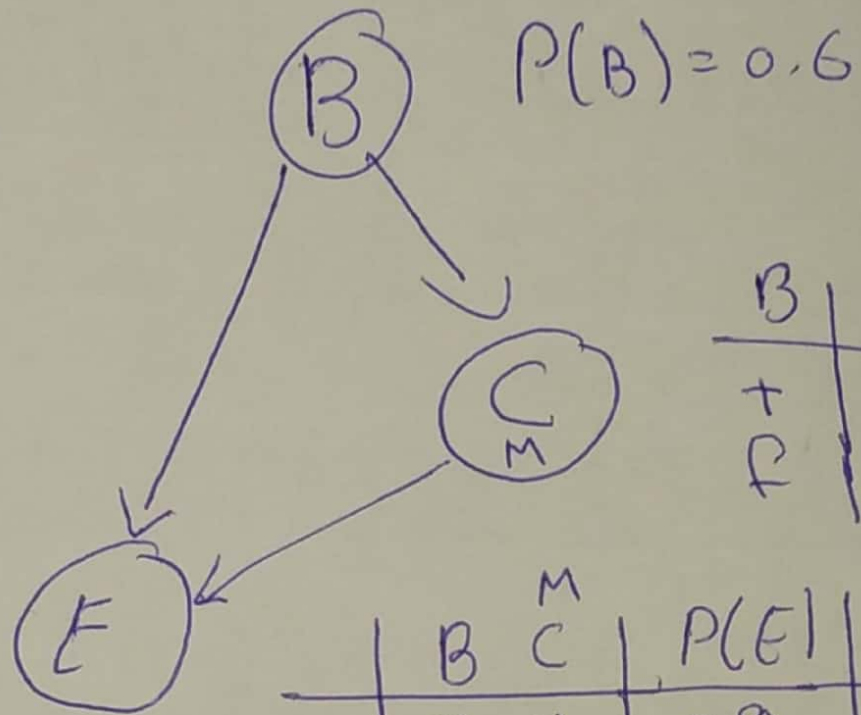


$$Q(S, a) = Q(S, a) + \alpha (R(S) + \gamma \max_{a'} Q(S', a') - Q(S, a))$$

$$Q(A, \downarrow) = 2 + 0.9 (1 + 0.5 \times 3 - 2) = 2.45$$

$$Q(S, a) = Q(S, a) + \alpha (R(S) + \gamma Q(S', a') - Q(S, a))$$

$$= 2 + 0.9 (1 + 0.5 \times 2 - 2) = 2$$



B	$P(C)$	$P(C)$
T	0.8	0.2
F	0.4	0.6

B	C	$P(E)$
T	T	0.9
F	T	0.8
T	F	0.2
F	F	0.1