UNITED INTERNATIONAL UNIVERSITY

ASSIGNMENT-2
SUMMER 2024

Presented By

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[redacted]

Artifi[redacted]ligence - D

Ans to the ques no: 2

The neighbour will accept if the values $R \leq P$. And $P = e^{\Delta E/T}$.

(a)

for T = 8 :

neighbour 1 :

$\Delta E = 4 - 10 = -6$; $P = e^{-6/8} = 0.472 < 0.55$

[not accepted].

Neighbour 2 :

$\Delta E = 9 - 10 = -1$; $P = e^{-1/8} = 0.9 < 0.95$

[not accepted]

neighbour 3 :

$\Delta E = 5 - 10 = -5$; $P = e^{-5/8} = 0.53 > 0.5$

[accepted].

neighbour 4 :

$\Delta E = 12 - 10 = 2$; $P = e^{2/8} = 1.28 > 0.1$

[accepted].

neighbour 5:

$\Delta E = 6-10 = -4$; $P = e^{-4/8} = 0.6 > 0.35$

[accepted].

for $T = 8$; neighbour 3, 4, 5 will be accepted.

(b)

for $T = 2$:

neighbour 1: $P = e^{-6/2} = 0.05 < 0.55$ [not]

neighbour 2: $P = e^{-1/2} = 0.6 < 0.95$ [not]

neighbour 3: $P = e^{-5/2} = 0.08 < 0.5$ [not]

neighbour 4: $P = e^{2/2} = 2.72 > 0.1$ [accepted]

neighbour 5: $P = e^{-4/2} = 0.135 < 0.35$ [not]

for $T = 2$; neighbour 4 will be accepted.

(c)

for $T = \infty$:

$P = e^{\Delta E/T} = e^{\Delta E/\infty} = e^{0} = 1$

all neighbour will be accepted. Because there is no random generator values that is greater than 1.

Ans to the ques no: 2

(a)

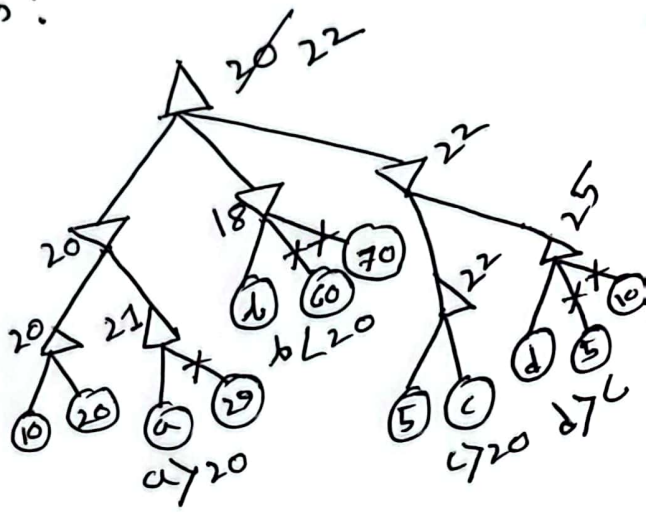
range of values:

a → a > 20

b → b < 20

c → c > 20

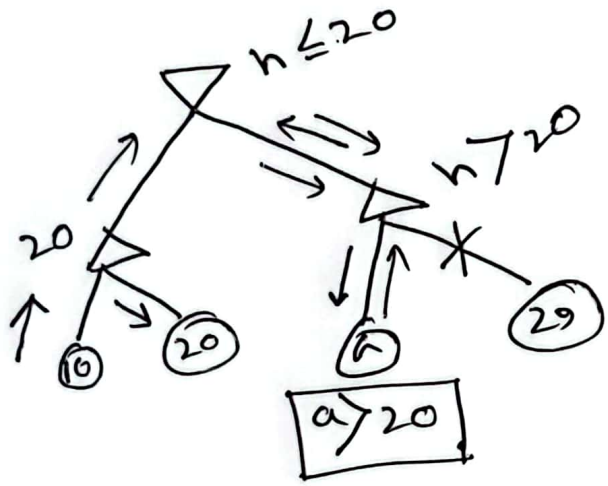
d → d > c



(b)

first of all by applying DFS the left most branch (max) checking between 10 & 20; which one is greater. So in the upper left most branch (min) it pass the value 20. Again it come down to "a". Now "a"s parent is max and that max's parent is min. So, If I give the "a" value greater

than 20 because the min branch updated the parent with 20. So the chosen value of a prunes the branch with utility value of 29.



Ans to the ques no: 3

Variables: {1, 2, 3, 4, 5, 6, 7}

Domains: {r, g, b, w}

constraints:

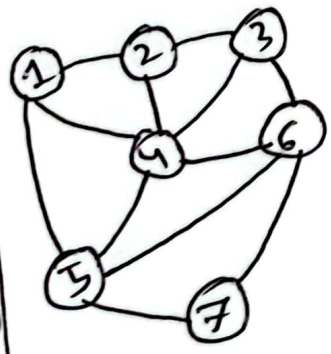
1 = {r}

3 ≠ {g, b}

7 ≠ {g}

1 ≠ (2, 3, 5)
2 ≠ (1, 3, 4)
3 ≠ (2, 4, 6)
4 ≠ (1, 2, 3, 5, 6)
5 ≠ (1, 4, 6, 7)
6 ≠ (3, 4, 5, 7)
7 ≠ (5, 6)

graph:



steps:

C \ V,P	1	2	3	4	5	6	7	process
	rgbw	rgbw	rgbw	rgbw	rgbw	rgbw	rgbw	assigning all
addi con	r	rgbw	rbw	rgbw	rgbw	rgbw	rbw	
1=r	(r)	gbw	rw	gbw	gbw	rgbw	rbw	mcv, lcv
3=r	(r)	gbw	(r)	gbw	gbw	gbw	rbw	mcv, lcv
2=b	(r)	(b)	(r)	gw	gbw	gbw	rbw	mcv, lcv
4=g	(r)	(b)	(r)	(g)	bw	bw	rbw	mcv, lcv
5=b	(r)	(b)	(r)	(g)	(b)	w	rw	mcv, lcv
6=w	(r)	(b)	(r)	(g)	(b)	(w)	r	mcv, lcv
7=r	(r)	(b)	(r)	(g)	(b)	(w)	(r)	mcv

Solution:

(1, 2, 3, 4, 5, 6, 7) = (r, b, r, g, b, w, r)