University of Asia Pacific

Admit Card

Final-Term Examination of Spring, 2021

Financial Clearance	PAID

Registration No : 18101064

Student Name : Md. Sohanuzzaman Soad

Program : Bachelor of Science in Computer Science and Engineering

SI.NO.	COURSE CODE	COURSE TITLE	CR.HR.	EXAM. SCHEDULE
1	CSE 400	Project / Thesis	3.00	
2	CSE 401	Mathematics for computer Science	3.00	
3	CSE 403	Artificial Intelligence and Expert Systems	3.00	
4	CSE 404	Artificial Intelligence and Expert Systems Lab	1.50	
5	CSE 405	Operating Systems	3.00	
6	CSE 406	Operating Systems Lab	1.50	
7	CSE 407	ICTLaw, Policy and Ethics	2.00	
8	CSE 410	Software Development	1.50	
9	CSE 427	Topics of Current Interest	3.00	

Total Credit: 21.50

1. Examinees are not allowed to enter the examination hall after 30 minutes of commencement of examination for mid semester examinations and 60 minutes for semester final examinations.

2. No examinees shall be allowed to submit their answer scripts before 50% of the allocated time of examination has elapsed.

3. No examinees would be allowed to go to washroom within the first 60 minutes of final examinations.

4. No student will be allowed to carry any books, bags, extra paper or cellular phone or objectionable items/incriminating paper in the examination hall.
Violators will be subjects to disciplinary action.

This is a system generated Admit Card. No signature is required.

UNIVERSITY OF ASIA PACIFIC

Department of Computer Science & Engineering

Final Examination
Spring-2021

Student Name	:	Md. Sohanuzzaman Soad
Student ID	:	18101064
Section	:	B
Year	:	4^{th}
Semester	:	1^{st}
Course Code	:	CSE 403
Course Title	:	Artificial Inteligence
Date	:	15-November-2021

ID: 19.01064

Ans to the Que. No: 1(a)

Posterion Probablity: A posterion Probablity, in byerian method is, the probablity of event A occuring given that event B has occured.

Likelihood: Likelihood is the reverse of posterion probablity.

Prior Probablity: Probablity of event A occuring before knowing anything about event B.

Example: If the sky is clean then we can go Here 1st event is unknown. If event A is occured then B.

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Ans to the Que No: 1(b)

Last 2 digit = 64 mod 3 = 1

predict the probablity that "Players will play if Weather is cloudy"

Frequency Table			Likelihood Table	
Weather	Y	N	Y	N
Sunny	2	1	2/3	1/3
Rainy	1	2	1/2	2/2
Cloudy	1	1	1/2	1/2

Let,

A = Playing Cricket "Yes"

B = Weather "cloudy"

$$P(A|B) = \frac{P(B/A) * P(A)}{P(B)}$$

$$= \frac{1/2 * 4/8}{2/8}$$

$$= 1$$

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Ans to the Que. No: 2(a)

Admissiblity: A heuristic is admissible if the estimated cost is never more than the actual cost from the current node to goal node.

Consistency: A heuristic is consistent if the cost from the current node to a successor node, plus the estimated cost from the sucessor node to the goal is less than or equal to the estimated cost from the current node to the goal node.

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Ans to the Que. No: 2(b)

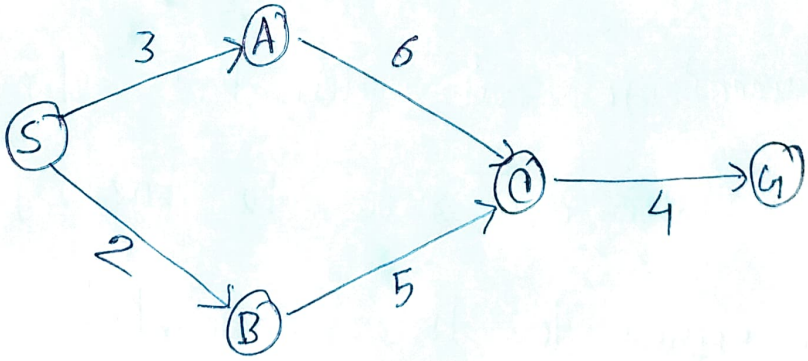
$h(S) = 1$

$h(A) = 64 \bmod 2 + 3 = 3$

$h(B) = h(A) + 4 = 7$

$h(C) = 64 \bmod 4 + 2 = 2$

$h(G) = 0$



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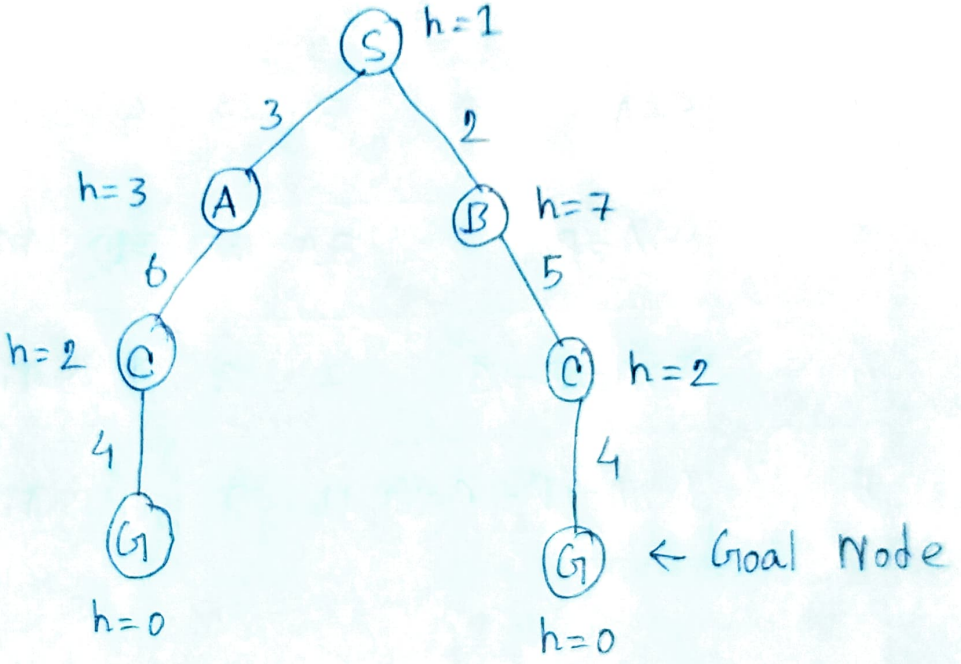
Search Tree :



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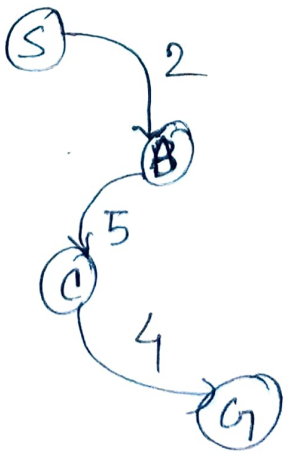
A* Search:

Iteration	Path Expanded	g(n)	h(n)	f(n)	CF	OF
1	S	0	7	1	S	A 3+3 , B 2+7
2	S→A	3	3	6	S,A	B 2+7 , C 9+2
3	S→A→B	2	7	9	S,A,B	C 9+2 , C 7+2
4	S→A→B→C	7	2	9	S,A,B,C	C 9+2 , G 11+0
5	S→A→B→C→G	11	0	11	S,A,B,C,G	C 9+2

Path Return : S → B → C → G

Path cost : 11



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Ans to the Que. No: 4

No	Initial Population	Fitness Score	Fitness Percentage	Expected count	Actual Count
1	14623752	26	0.33	1.32	1
2	72528613	12	0.15	0.6	1
3	85621537	22	0.28	1.12	1
4	51643275	19	0.24	0.96	1

Calculation Draft:

Fitness percentage:

1) $\frac{26}{79} = 0.329$

2) $\frac{12}{79} = 0.151$

3) $\frac{22}{79} = 0.278$

4) $\frac{19}{79} = 0.240$

here $i = 4$

Expected count:

1) $0.33 \times 4 = 1.32$

2) $0.15 \times 4 = 0.6$

3) $0.28 \times 4 = 1.12$

4) $0.24 \times 4 = 0.96$

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Crossover point; $64 \bmod 4 + 2 = 2$

Crossover:

No	Mating pool	xover point	offspring after xover
1	14|62 3752	2	14 62 1537
3	85|62 1537	2	85 62 3752
3	85|62 1537	2	85 64 3275
4	51|64 3275	2	51 62 1537

Mutation:

mutation Digit = $64 \bmod 3 + 4 = 5$

No	offspring after xover	offspring After mutation
1	1462<u>1</u>537	1462 8537
3	8562<u>3</u>752	8562 8752
3	8564<u>3</u>275	8564 8275
4	5162<u>1</u>537	5162 8137

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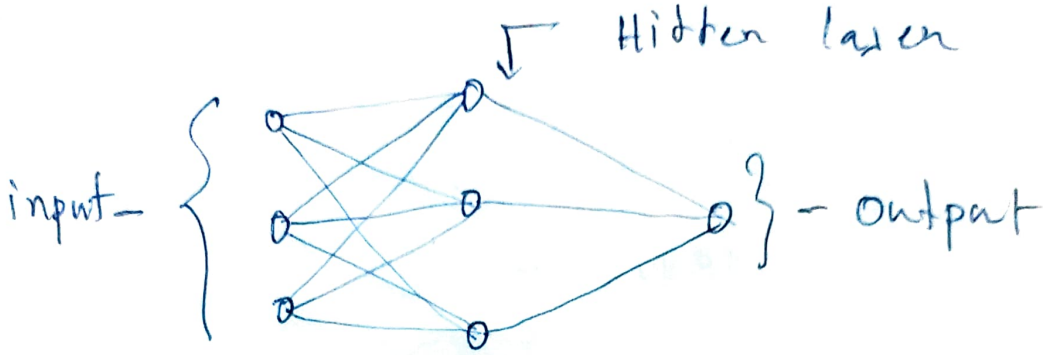
Ans to the Que. NO: 3 (a)



Back-propagation neural network is a multilayer network and the layer are fully connected. The Algorithm called back-propagation because the weights are updated backward from outputs toward-input. Learning process has two stages firstly initialize the weights and set other parameter then read from input and generate output. If error then update the weights.

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Ans to the Que. No: 3 (b)

Feature Vector $x = [1\ 1\ 0]$

my ID = 18101064

$w_1 = 64 \bmod 3 - 0.3$

$= 0.7$

$w_2 = 0.7 + 0.4$

$= 1.1$

$w_3 = 1.1 - 0.2$

$= 0.9$

Here given,

$x_1 = 1$
$x_2 = 1$ } inputs

$x_3 = 0$

$Y_a = 1$ } output

$\theta = 0.3$ [threshold]

$\alpha = 0.1$ [learning rate]

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① Predicted output:

$$Y_p = \text{step}((x_1w_1 + x_2w_2 + x_3w_3) - \theta)$$

$$= \text{step}((1 * 0.7) + (1 * 1.1) + (0 * 0.9) - 0.3)$$

$$= \text{step}(1.8 - 0.3)$$

$$= \text{step}(1.5)$$

$$\text{step}(x) = \begin{cases} 1 : x \geq 0.5 \\ 0 : x < 0.5 \end{cases}$$

$$Y_p = 1$$

(11)

$$\text{error}, e = Y_a - Y_p$$

$$= 1 - 1$$

$$= 0$$

$$w_1 = (w_1 + \alpha * x_1 * e)$$

$$= (0.7 + 0.1 * 1 * 0)$$

$$= 0.7$$

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$$w_2 = (w_2 * \alpha * x_2 * e) = (1.1 + 0.1 * 1 * 0)$$

$$= 1.1$$

$$w_3 = (w_3 + \alpha * x_3 * e) = (0.9 + 0.1 * 0 * 0)$$

$$= 0.9$$