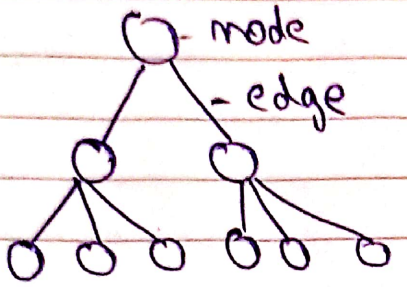
Harsh Mittal
21K19CSUN01019
CSE 3B

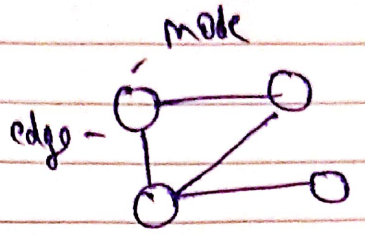
January 2019 02
Wk 01 • 002-363 Wednesday

Tut - 0 A.I

1.

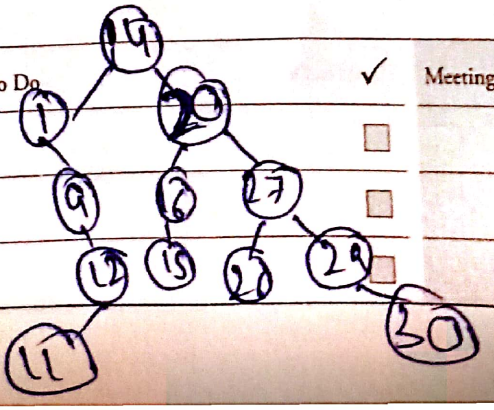


Tree



Tree	Graph
① It used to represent hierarchical relationship.	① It used to present the relationship among data items
② There is exacty one node without Parent, which is called root. the nodes without children are called leaves.	② Each node represent an item.
	③ Each edge represent the relationship b/w two items.

2. (a) 3
(b) 2
(c) Pre-order - ~~ABCD~~ ABDECFG
Inorder - DBEAFCG
Postorder - DEBFGCA



Important Calls ✓	Things to Do ✓	Meetings ✓
☐	☐	☐
☐	☐	☐
☐	☐	☐

MANAV RACHNA UNIVERSITY
Department of CST
(Artificial Intelligence – CSH205B-T & P)

(**Tutorial 1**)

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Class: BTECH CSE 4B
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1. What is Intelligence? What are the ways to demonstrate it?

Ans 1. Artificial Intelligence is study of how to make computers do things which at the moment people do better. Ways to demonstrate it

- Systems that think like humans
- Systems that think rationally
- Systems that act like humans
- Systems that act rationally

2. What is the difference between Natural Intelligence & Artificial Intelligence? Discuss the differences between a human and a machine in the context of intelligence.

Natural Intelligence	Artificial Intelligence
Natural intelligence or the behavior of the human being has come to past experiences and the doings based upon situation, environment.	Artificial Intelligence is based on the human insights that can be decided in a way that machine can effortlessly actualize the tasks, from basic to those that are indeed more complex.
Humans' choices may be affected by subjective components which are not based on figures alone.	AI is objective in choice making because it analyzes based on data.
Human insights can be adaptable in reaction to the changes to its environment. This makes individuals able to memorize and ace different skills.	AI takes much more time to adjust to unused changes.
In terms of speed Natural Intelligence	As compared to Natural Intelligence,

cannot beat the speed of AI	Artificial Intelligence can handle more data at a speedier rate.

3. Discuss the major applications of artificial intelligence. Discuss each briefly in terms of the role of AI in each application.

Major role of Artificial Intelligence:

1. AI in healthcare: In the last five to ten year, AI becoming more advantageous for the healthcare industry and going to have a significant impact on this industry.
2. AI in gaming: AI can be used for gaming purpose. The AI machines can play strategic games like chess, where the machine needs to think of a large number of possible places.
3. AI in finance: AI and finance industries are the best matches for each other. The finance industry is implementing automation, chatbot, adaptive intelligence, algorithm trading, and machine learning into finance processes.
4. AI in Social Media: Social media sites such as Facebook, Twitter and Snapchat contain billions of user profiles, which need to be stored and managed in a very efficient way. AI can organize and manage massive amounts of data. AI can analyze lots of data to identify the latest trends, hashtag and requirement of different users.

4. Discuss the Tic-Tac-Toe problem and how AI techniques help in providing an effective solution to it.

Tic Tac Toe consist two player in it where one player is max(X) and other player is min(0). It consists of three state initial state which is an empty state, intermediate state and winning state also known as goal state.

AI recognizes the winning condition when either row, column or diagonals is completely filled with X or 0.

Algorithm:

Step 1. Take value of the vector board as a base 3 number. Convert it to decimal.

Step 2. Use the number computed in Step 1 as an index into Move Table and access the vector(X) stored there.

Step 3. Set board equal to vector X in Move Table

Ans 1- Production system consists of

1. Set of rules (working memory): which are in the form of $P \rightarrow Q$ where left side represent the current state and right side represent a result or generated output
2. Knowledge/Database: It contains whatever info is required for the particular task. Some info. may be permanent or some may be the solution of current problem.
3. Control strategy: It is way to resolve the conflicts which arrive when several rules match at once.
4. Rule applier: It checks the ability applicability of the rules by matching the current state with left hand side of the rule and find appropriate rule from the databases of rules.

State space

Need → Exactly 2 gallons of water into the 4-gallon jug.

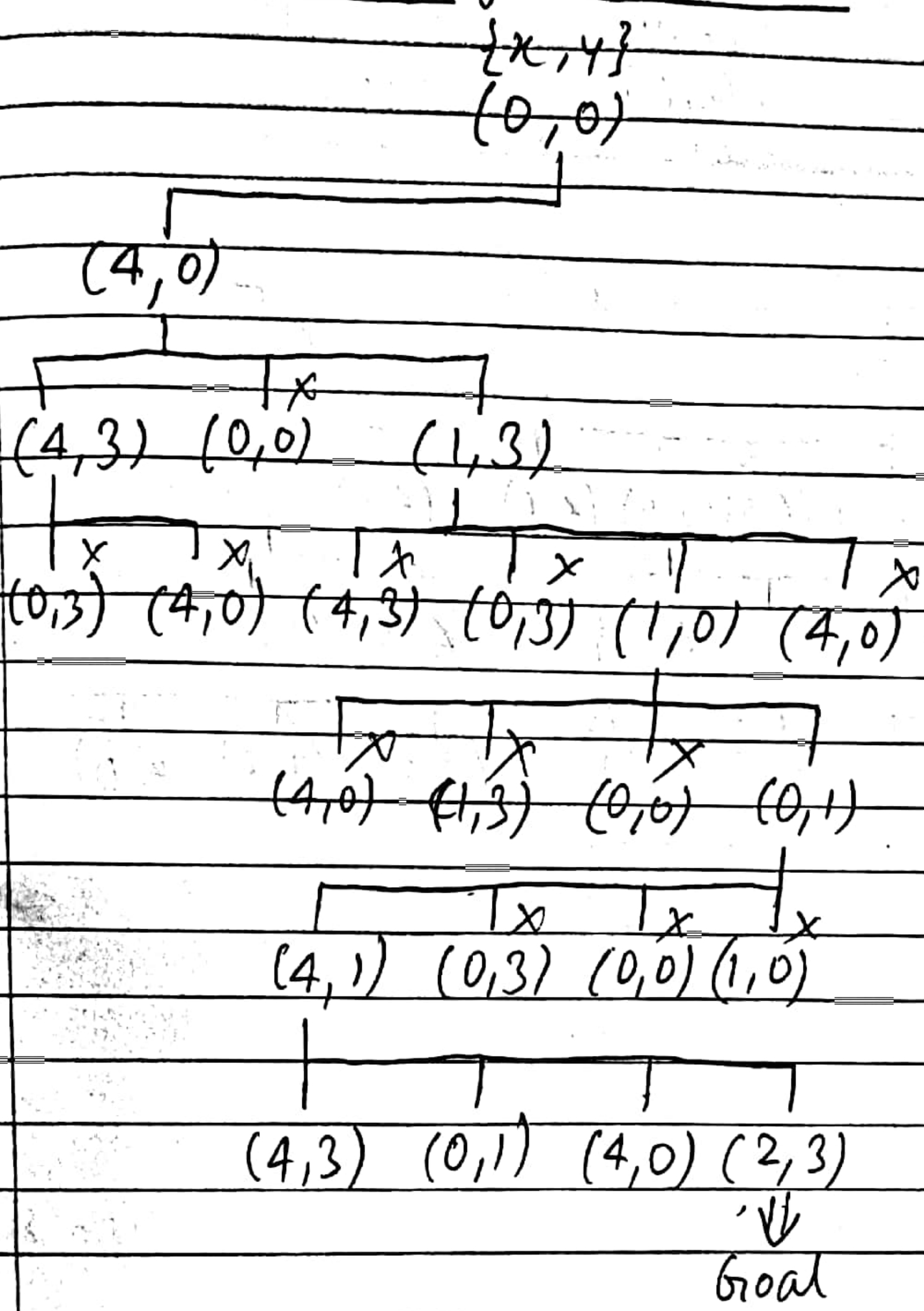
1. First fill water in 3L jug completely
   $X=0, y=3$
2. Fill water from y to x
   $x=3, y=0$

Because we need 3L water in 4L jug.

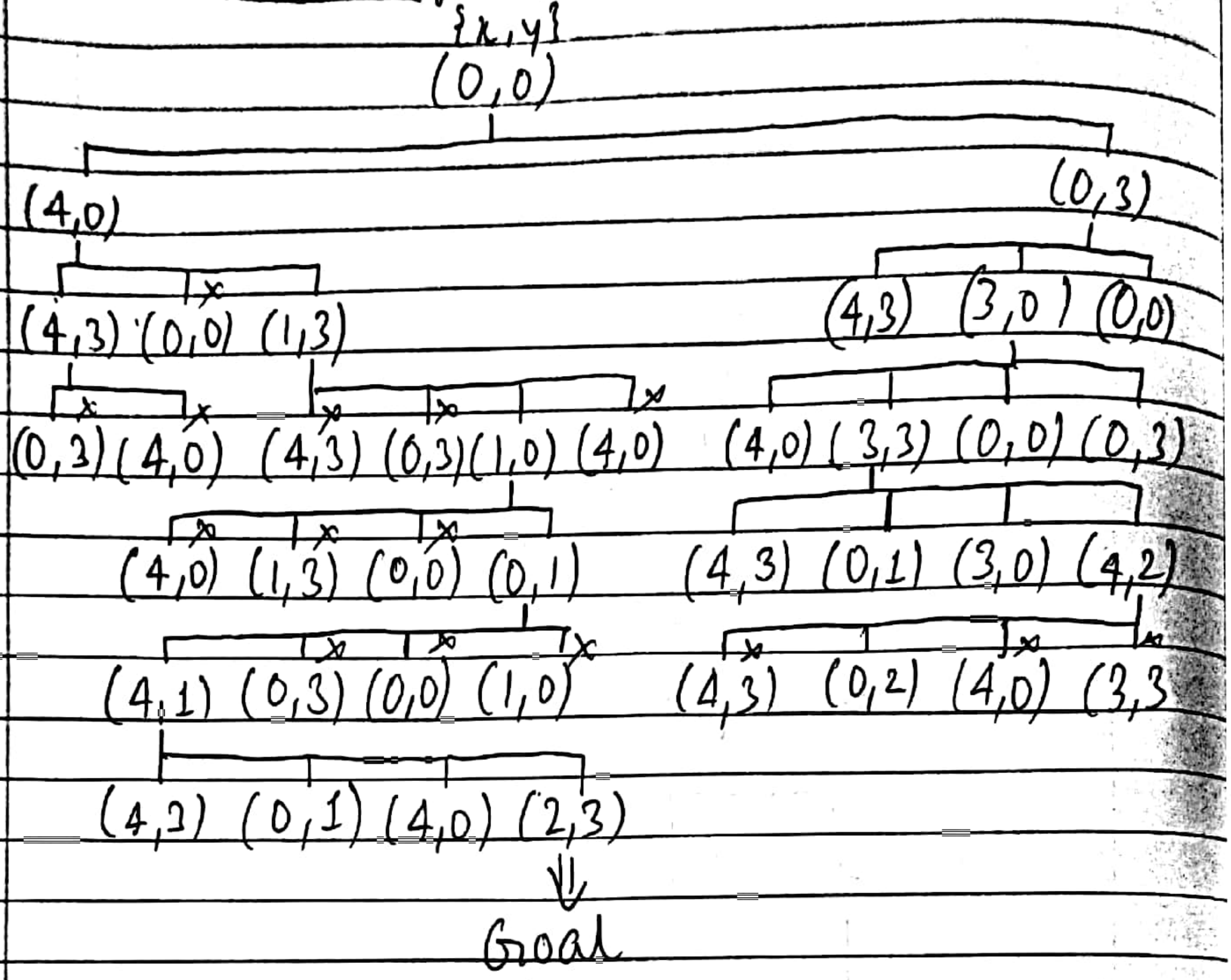
3. Again fill y fully
   $x=3, y=3$
4. x's capacity is 4L and y's capacity is 3L
   Now, we will fill x completely using y.
5. At the end, $x=4, y=2$
   We get 2L water in y jug.

Ans 2-

Depth first Search



Breadth first Search



Ans 2-

A	-7	H	
H	-6	G	Hy = 28
G	-5	F	
F	-4	E	
E	-3	D	
D	-2	C	
C	-1	B	
B	0	A	

Hy = -28

Initial state

Goal state

① -

H	-6
G	-5
F	-4
E	-3
D	-2
C	-1
B	0 A 0

②

G	-5
F	-4
E	-3
D	-2
C	-1
B	0 A 0 H 0

③ -

F	-4
E	-3
D	-2
C	-1
B	0 A 0 G 0 H 0

④

E	-3
D	-2
C	-1
B	0 A 0 F 0 G 0 H 0

⑤

D	-2
C	-1
B	0 A 0 E 0 F 0 G 0 H 0

⑥

C	-1
B	0 A 0 D 0 E 0 F 0 G 0 H 0

⑦ B 0 A 0 C 0 D 0 E 0 F 0 G 0 H 0

⑧

B	1
A	0 C 0 D 0 E 0 F 0 G 0 H 0

⑨

C	2
B	1
A	0 D 0 E 0 F 0 G 0 H 0

(10)

D	3
C	2
B	1
A	0 E 0 F 0 G 0 H 0

(11)

E	4
D	3
C	2
B	1
A	0 F 0 G 0 H 0

(12)

F	5
E	4
D	3
C	2
B	1
A	0 G 0 H 0

(13)

G	6
F	5
E	4
D	3
C	2
B	1
A	0 H 0

(14)

H
G
F
E
D
C
B
A

Goal