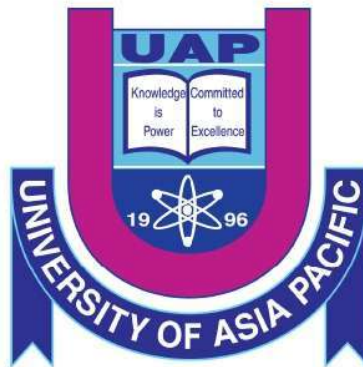


UNIVERSITY OF ASIA PACIFIC

MID SEMESTER EXAMINATION



SPRING 2021

CSE 403

ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS

HASAN TAHSIN RAFSAN

18101009

A1 SECTION

ROLL 9

4TH YEAR

1ST SEMESTER

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

12 SEPTEMBER 2021



University of Asia Pacific

Admit Card

Mid-Term Examination of Spring, 2021

Financial Clearance

PAID

Registration No : 18101009

Student Name : Hasan Tahsin Rafsan

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.

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Day

Time:

Date: / /

Ans: 1

Q The Turing test, proposed by Alan Turing was designed to provide a satisfactory operational definition of intelligence. A computer passes the test if a human interrogator, after posing some written questions, can't tell whether response come from a person or computer.

An intelligent machine (e.g. computer) should possess the following capabilities to pass the Turing test:-

- (i) Natural image processing:- to enable it to communicate successfully in English.
- (ii) Knowledge representation:- to store what it knows or hears.
- (iii) Automated reasoning:- to use the stored information to answer questions & to draw new conclusions.
- (iv) Machine learning:- adopting a new ~~idea~~

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Day

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Time:

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~~circumstances~~ circumstances & to detect
& extrapolate pattern.

For total tuning test: includes a video signal so that the interrogator to pass the physical objects through the hatch. For this, we need these additional capabilities:

- ① computer vision: to perceive objects &
- ② robotics: to manipulate objects & more about.

~~③~~ ⑥ Trash Picking Robot

PEAS description

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Day

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Time:

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Performance

cleanliness
efficiency
security
battery

Environment:

room,
table
chair
~~car~~
obstacles.

Actuators

left
right
suck
no op.

Sensors

camera,
bump sensor,
dist. detection
sensor,
infrared wall sensor

Ans. 3@ Simple Reflex Agent:

These are the simplest agents. These agents take decisions on the basis of the current percepts & ignore the rest of the percept history.

These agents only succeed in the fully observable environment. It doesn't consider any part of percepts history during their decision & action process.

It works on condition action rule.

Which means it maps current state to action. Ex: Room cleaner agent, which only works only if there is dirt in the room.

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Day

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Model based Reflect Agent:-

It can work in a partially observable environment. Ee track the simulation.

A model based agent has 2 important factors.

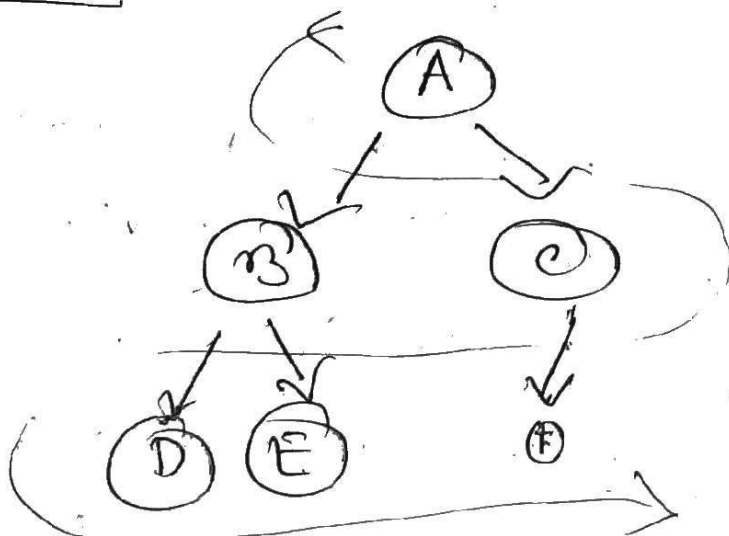
Model: - which is knowledge about how things happen in the world. so, it's called model-based agent.

Internal state: - It is a representation of the current state based on the model ~~per~~ they perform actions. Updating the agent state requires information about: - how the world evolves, how the agent's action affects the world.

①

~~BFS~~

Node G: A, B, C, D, E & F.

① BFS: Breadth First Search:-

Here:

← [A] ←

← [B C] ←

← [D E] ←

← [F] ←

← [] ←

← [] ←

A → B → C → D → E → F.

Sub: 18/01/09

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Day

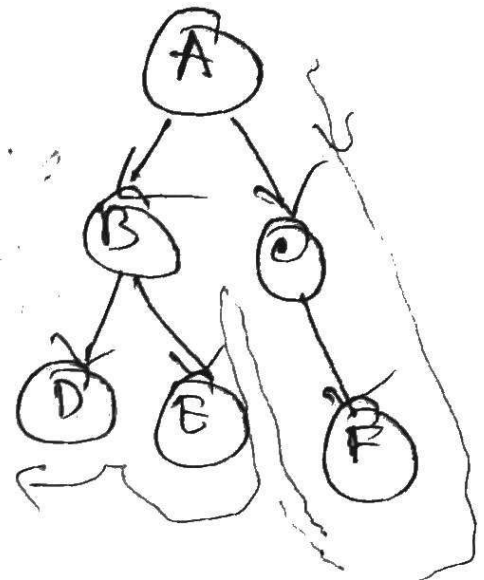
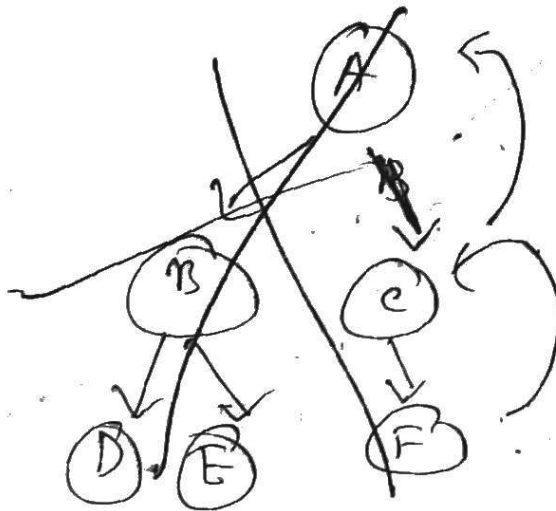
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DFS

Depth First Search.



Here.

~~A B C B E D~~

A → C → F → B → E → D

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Day

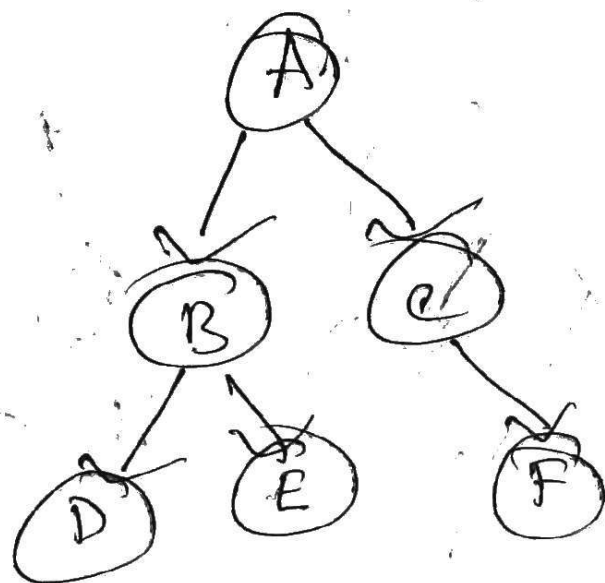
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IM

IDS

Iterative Deeping Search



level 0.

level 1

level 2

iteration 1

A

iteration 2

A → B → C

iteration 3

~~A → B → C → D → E → C → F~~

A → B → D → E → C → F

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Day

Time

Date: / /

Ans: 2

$A = 18101009$

Last 2 dig = 09

$$h(A) = 09 \% 4 + 2 = 3$$

$$h(B) = 09 \% 5 + 3 = 7$$

$$h(C) = 09 \% 6 + 1 = 4$$

$$h(D) = 09 \% 5 + 2 = 6$$

$$h(E) = 09 \% 4 + 1 = 2$$

$$h(G) = 0$$

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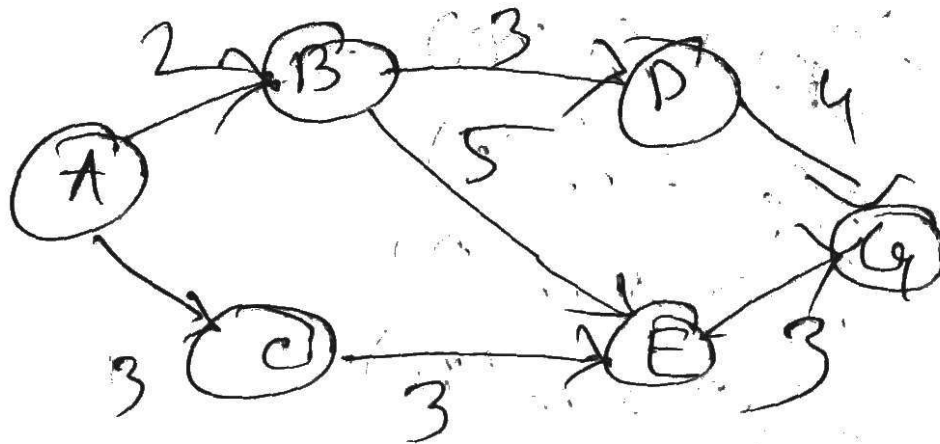
Day

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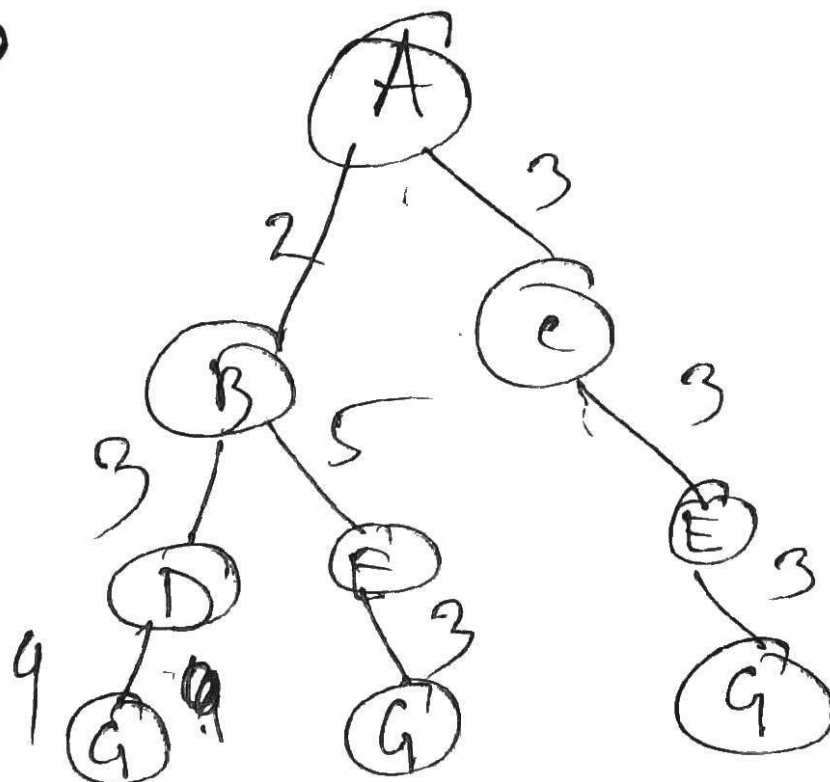
Time:

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/ /



~~A~~



Sub: 18101009

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Day

Time:

Date: / /

$$F(A) = g(A) + h(A) = 0 + 3 = 3$$

$$F(B) = g(B) + h(B) = 2 + 7 = 9$$

$$F(C) = g(C) + h(C) = 3 + 4 = 7 \quad [A \rightarrow C]$$

$$F(D) = g(D) + h(D) = 3 + 6 = 9$$

$$F(E) = g(E) + h(E) = 5 + 2 = 7 \quad [B \rightarrow E]$$

$$F(G) = g(G) + h(G) = 4 + 0 = 4 \quad [D \rightarrow G]$$

$$F(H) = g(H) + h(H) = 3 + 9 = 12$$

$$F(G) = 3 + 0 = 3 \quad \left\{ \begin{array}{l} C \rightarrow G \\ E \rightarrow G \end{array} \right.$$

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Day

Time

Date

~~A → B → D → G =~~

$$A \rightarrow B = 2$$

$$A \rightarrow B \rightarrow D = 2 + 3 = 5$$

$$A \rightarrow B \rightarrow D \rightarrow G = 2 + 3 + 4 = 9$$

$$\begin{array}{r} 1+1 \\ \hline \end{array}$$

$$\begin{array}{r} 1+2 \\ \hline \end{array}$$

$$\begin{array}{r} 1+3 \\ \hline \end{array}$$

$$A \rightarrow C = 3$$

$$A \rightarrow C \rightarrow E = 3 + 3 = 6$$

$$A \rightarrow C \rightarrow E \rightarrow G = 3 + 3 + 3 = 9$$

$$\begin{array}{r} 1+1 \\ \hline \end{array}$$

$$\begin{array}{r} 1+2 \\ \hline \end{array}$$

$$\begin{array}{r} 1+3 \\ \hline \end{array}$$

$$A \rightarrow B \rightarrow E = 2 + 5 = 7$$

$$A \rightarrow B \rightarrow E \rightarrow G = 2 + 5 + 3 = 10$$

So, shortest path will be 9

either $A \rightarrow B \rightarrow D \rightarrow G$ or $A \rightarrow C \rightarrow G$.

But, After iter 2, $A \rightarrow B \rightarrow D = 5$ where

$A \rightarrow C \rightarrow E$ is 6. So, the path will be

$A \rightarrow B \rightarrow D \rightarrow G$. cost will be 9.

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Day

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because after iteration 2

$ABD < ACE$

'5' < 6

So, $A \rightarrow B \rightarrow D \rightarrow C$