

SREE NARAYANA GURUKULAM COLLEGE OF ENGINEERING

(Affiliated to A P J Abdul Kalam Technological University & Approved by A.I.C.T.E.)
KADAYIRUPPU, KOLENCHERY



"Like the fire that emerges out of churning sticks
That boundless wisdom comes from
within for those who seek"

- Sree Narayana Guru

COURSE DIARY

Code & Subject : CST401- ARTIFICIAL INTELLIGENCE

Semester : S7 B Month/Year : 2022

Name of Teacher : Archana P.S Department : CSE

A. Archana



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DISTRIBUTION OF SESSIONAL MARKS

Theory Subject		Practical / Drawing	
Attendance	10	Regular Class Viva	
Assignments	15	Regular Class work/ Drawing/ Workshop Record/Lab Record/Class performance	
Tests	25	Tests	

TIME SCHEDULE OF CLASSES

Period	1	2	3	4/N	N/4	5	6	7
Day								
Mon			R7B					
Tue								
Wed				R7B			R7B	
Thu	R7B							
Fri								R7B(T)


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Class: BT B

Subject with Code No: (57 401 Artificial intelligence) of period per week 4

Class No	Name	Month		Date														
		Sept	October	29	10	12	13	14	17	19	19	20	21	26	26	27	28	
		Period		1	3	4	6	1	7	3	4	6	1	7	4	6	1	7
1.	JESWIN ANTONY D COUTH	a	x	x	x	x	x	a	x	x	x	x	a	a	x	x	x	x
2	JIYA MA	x	x	a	a	x	x	x	x	x	x	x	x	x	x	x	x	x
3	JOLL ELDO	x	x	a	a	x	x	x	x	x	a	a	x	a	x	x	x	x
4	JUSTIN JACOB	x	x	a	x	x	x	x	x	x	x	x	x	a	a	x	x	x
5																		
6	MIDHUNRAJ C	x	x	a	x	x	x	a	x	x	x	a	x	a	x	a	x	a
7	MICHAEL A.S	x	x	a	x	x	x	x	x	x	x	x	x	x	x	x	x	a
8	MOHAMMED HARSHAN	a	x	x	x	x	x	x	x	x	x	a	x	x	x	x	x	x
9.	MOHIT A A	a	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
10	MRUDULA JAMES CHEMMANUR	x	x	x	x	x	x	a	x	x	x	x	x	x	x	x	x	x
11.	MUHAMMED ARSHAD P.P	x	a	x	x	x	x	x	x	x	x	x	x	x	x	x	x	a
12	NANDU V NAIR	x	x	x	x	x	x	x	x	x	x	a	x	x	x	x	x	x
13	NAYYA NARAYANAN	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
14	NEHA JOY	x	x	a	a	x	x	x	x	x	x	x	x	x	x	x	x	x
15	NIRANJAN RAVI	x	x	a	a	x	x	x	x	a	a	x	x	x	x	x	x	x
16	PREETITH JAYAN	x	x	x	x	x	x	x	x	x	a	x	x	x	a	x	x	a
17	RETTU REJI	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
18	ROBIN RAJAN	x	a	x	x	x	a	x	x	x	x	x	x	x	x	x	x	x
19	ROSHAN P AJITH	x	x	x	x	x	a	x	x	x	a	x	x	x	x	x	x	x
20	SABIK R	a	x	x	x	x	x	a	a	x	a	a	a	x	a	x	a	a
21	SAFNA AREEZ	x	x	a	x	x	x	x	x	a	x	a	a	a	x	x	x	x
22	SAM SAJU	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
23																		
24	SANDRA P.B	x	x	a	x	x	a	x	x	x	x	x	x	x	x	x	x	x
25	SHINE SURESH	x	x	x	x	x	x	x	x	x	a	x	x	x	a	x	x	a
26	SHREYA GIRREESH	x	x	a	a	x	x	x	x	x	x	x	x	x	x	x	x	x
27	SOORAJ SUNDARAN	x	x	x	x	x	a	x	x	x	x	x	x	x	x	x	x	x
28	SOORYADAS P.S	x	x	a	a	x	x	x	x	x	a	x	x	x	a	x	x	a
29	SREEKUTTY P.S	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

al No. of Class
al of faculty

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

verified

Smi the
15/10/2022



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Marks for Assignments				Marks for Internal Examinations				Internal Evaluation					Remarks		
1	2	3	Total (Avg)	1 (50)	2 (50)	3	Avg (25)	% of attendance	Practical Records/Outputs	Assignments/Regular Class Tests	Internal Exams	Total		Normalization	Total (50)
15	15		15	0.5	38		10	75						33	
15	15		15	31	41.5		18	100						43	
15	15		15	46	40		22	96						49	
15	15		15	44.5	48.5		23	96						48	
15	15		15	36	27.5		16	90						41	
15	15		15	14	30		11	81						35	
15	15		15	1	40		10	90						35	
15	15		15	34	10.5		11	96						36	
15	15		15	30.5	27		14	94						40	
15	15		15	33.5	25		15	88						39	
15	15		15	30	11		10	83						35	
15	15		15	28.5	20.5		12	90						37	
15	15		15	45.5	45.5		23	98						48	
15	15		15	46	49		24	94						49	
15	15		15	38	9		12	85						36	
15	15		15	41.5	38.5		19	92						44	
15	15		15	21.5	31		13	83						37	
15	15		15	2.5	84		9	85						39	
15	15		15	5.5	22		1	75						30	
15	15		15	41.5	34.5		19	81						43	
15	15		15	31.5	42		20	98						45	
15	15		15	25	23.5		12	88						37	
15	15		15	17.5	23.5		11	88						36	
15	15		15	35	37		18	94						43	
15	15		15	41	5		12	90						37	
15	15		15	40.5	11.5		13	75						37	
15	15		15	35.5	31.5		17	98						42	
abs	abs		abs	abs	abs		abs	abs						abs	

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A. Hewa

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No. of periods
per week

9

SUBJECT COVERAGE

Total Expected

9

Module	Sl No of Periods	Dates Planned	Topics Covered	Dates Engaged	Period	Mode of Instruction/Remarks	COs
IV	1.	10/11/2022	Logical Agents - Knowledge based agents and logic	24/11/2022	1	chalk & board	CO4
	2.	14/11/2022	Propositional Logic	28/11/2022	3	ppt	CO4
	3.	16/11/2022	Propositional Theorem proving.	28/11/2022	4	ppt	CO4
	4.	16/11/2022	Agents based on Propositional Logic.	30/11/2022	4	ppt + chalk & board.	CO4
	5.	17/11/2022	First Order Predicate Logic - Syntax & Semantics of First order logic	30/11/2022	6		CO4
	6.	21/11/2022	Using first order logic, Knowledge representation in first order logic.	1/12/2022	1	ppt + chalk & board	CO4
	7.	23/11/2022	Inference in first Order Logic - Propositional Vs first order inference, Unification & Lifting	5/12/2022	3	ppt	CO4
	8.	23/11/2022	Forward chaining, Backward chaining	7/12/2022	4	ppt + chalk & board	CO4
	9.	24/11/2022	Resolution.	7/12/2022 8/12/2022	6 1		CO4

18 hours.

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TUTORIAL LOG

No. of periods per week							Total Expected
Module	Sl. No of Periods	Dates Planned	Topics Covered	Dates Engaged	Period	Mode of Instruction	Remarks
	1.	14/10/2022	Write a note on history of AI and	14/10/2022	7		Verified Smith 18/11/22
	2	14/10/22	Applications of AI				
	3	21/10/22	Identify one AI you find interesting that can be anything from self driving car to smart watch. Describe its PRAS measures	21/10/22	7	ppt	
	4	28/10/22	Missionaries and cannibals problem	28/10/22	7	simulation	
	5.	9/11/22	Water jug problem.	9/11/22	6	simulation video	
	6	25/11/2022	Min-Max and Alpha-beta pruning problems	25/11/22	7		
	7	2/12/22	First order logic problems	2/12/22	7		
	8	16/12/22	Decision tree	16/12/22	7		Smith


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SYLLABUS

Syllabus

Module – 1 (Introduction)

Introduction – What is Artificial Intelligence(AI) ? The Foundations of AI, History of AI, Applications of AI. Intelligent Agents – Agents and Environments, Good behavior: The concept of rationality, nature of Environments, Structure of Agents.

Module – 2 (Problem Solving)

Solving Problems by searching-Problem solving Agents, Example problems, Searching for solutions, Uninformed search strategies, Informed search strategies, Heuristic functions.

Module - 3 (Search in Complex environments)

Adversarial search - Games, Optimal decisions in games, The Minimax algorithm, Alpha-Beta pruning. Constraint Satisfaction Problems – Defining CSP, Constraint Propagation- inference in CSPs, Backtracking search for CSPs, Structure of CSP problems.

Module - 4 (Knowledge Representation and Reasoning)

Logical Agents – Knowledge based agents, Logic, Propositional Logic, Propositional Theorem proving, Agents based on Propositional Logic. First Order Predicate Logic – Syntax and Semantics of First Order Logic, Using First Order Logic, Knowledge representation in First Order Logic. Inference in First Order Logic – Propositional Vs First Order inference, Unification and Lifting, Forward chaining, Backward chaining, Resolution.

Module - 5 (Machine Learning)

Learning from Examples – Forms of Learning, Supervised Learning, Learning Decision Trees, Evaluating and choosing the best hypothesis, Regression and classification with Linear models.

Text Book

1. Stuart Russell and Peter Norvig. Artificial Intelligence: A Modern Approach, 3rd Edition. Prentice Hall.

References

1. Nilsson N.J., Artificial Intelligence - A New Synthesis, Harcourt Asia Pvt. Ltd.

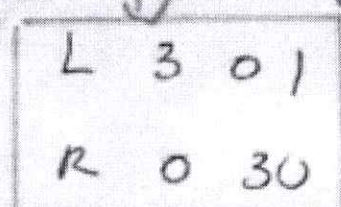
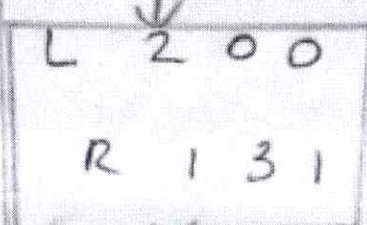
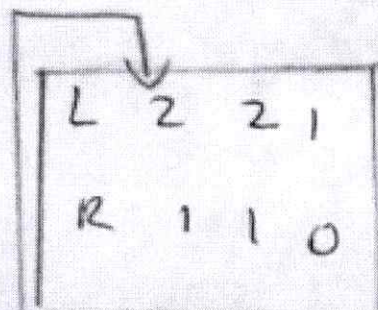
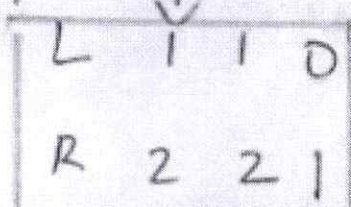
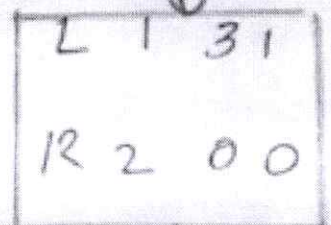
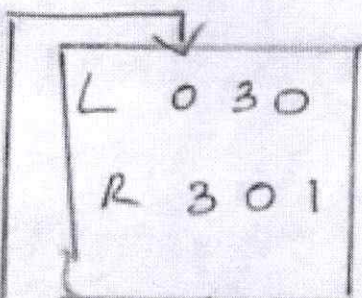
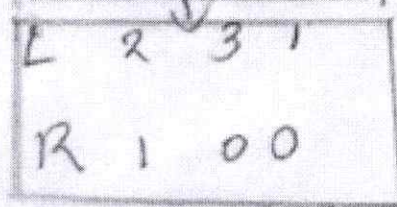
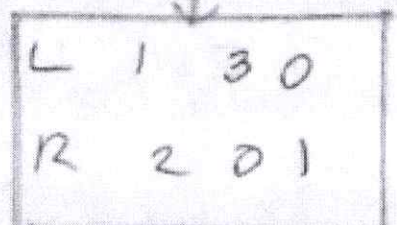
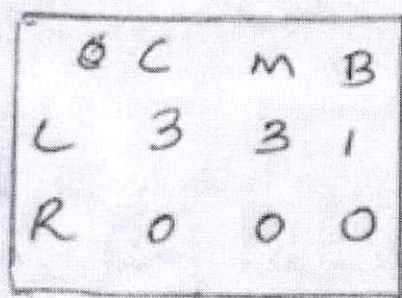
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Tutorial

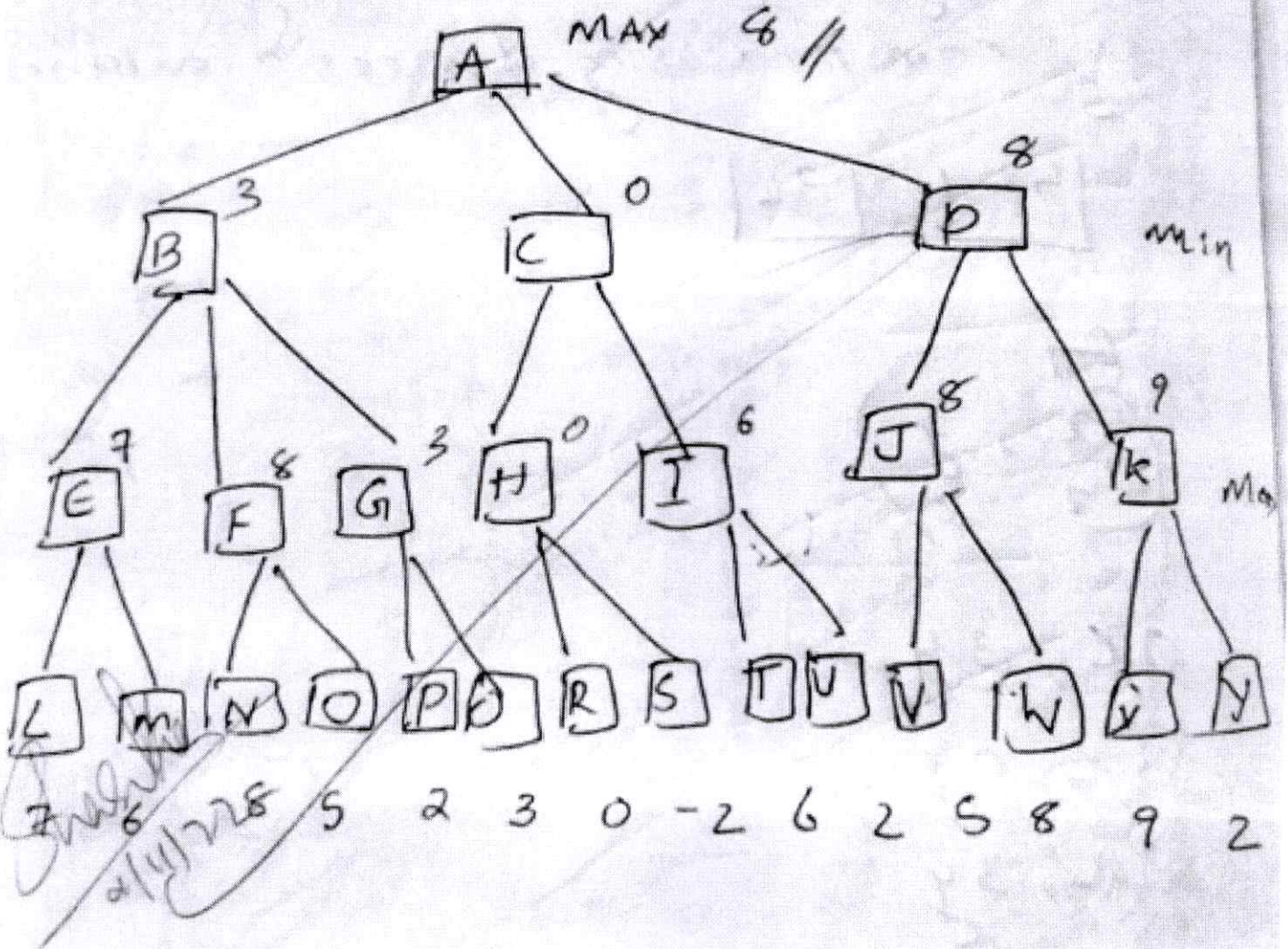
Missionaries and Cannibals problem. Three missionaries and three cannibals are on one side of a river along with a boat that can hold one or two people. Find a way to get everyone to the other side without ever leaving a group of missionaries in one place outnumbered by cannibals in that place. Draw a diagram of complete state space search.



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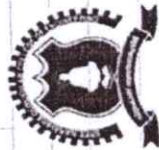


Q Consider the following game tree in which static evaluation score are all from the players point of view. static evaluation score range is (+10 to -10).



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DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING

Academic Year/Semester :2022-2023/S7, Batch: B

ASSIGNMENT 1

Subject: CST401 ARTIFICIAL INTELLIGENCE

NO.	DATE OF SUBMISSION	DATE OF RETURN AFTER EVALUATION	DESCRIPTION			
			QUESTIONS	MARKS	CO	LEVEL
			For the following activities, give a PEAS description of the task environment and characterize it in terms of the task environment properties. a) Playing soccer. b) Bidding on an item at an auction.	5	CO1	P
	10/29/2022	11/10/2022	What is a rational agent? Explain.	3	CO1	U
			Explain the structure Goal-based agents and Utility-based agents with the help of diagrams.	7	CO1	U
ASSIGNMENT-1 ANSWER KEY & MARK DISTRIBUTION						
	SL.No		Answer Key			Mark Division
	1		PEAS description for each question carries 2.5 mark each			2.5*2=5

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2	A rational agent or rational being is a person or entity that always aims to perform optimal actions based on given premises and information. A rational agent can be anything that makes decisions, typically a person, firm, machine, or software. definition-1.5 marks explanation-1.5 marks	1.5+1.5=3
3	Goal based agent-3.5 marks Utility-based agents -3.5	3.5*2=7


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AI ASSIGNMENT

SOORYADAS P.S

CSE-RTB

ROLL NO: 28

SNGCE

9/11/2022
[Signature]

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1) For each of the following activities, give a PEAS description of the task environment and characterize it in terms of the task environment properties

a- Playing soccer

b- Bidding on an item.

Agent Type	Performing Measure	Environment	Actuators	Sensors
Playing soccer	<ul style="list-style-type: none"> Scoring No penalties Not allowing the other team to score 	<ul style="list-style-type: none"> Soccer field Players Goalie Referees Coach Soccer ball Net 	<ul style="list-style-type: none"> Players legs Head Hands 	<ul style="list-style-type: none"> Eyes Ears
Bidding on an item at an auction	Attaining an item for lowest cost possible	<ul style="list-style-type: none"> Auctioneer Bidders Item 	VOIC	<ul style="list-style-type: none"> Eyes Ears

2) What is a Rational Agent? Explain

Artificial Intelligence is defined as the study of rational agents. A rational agent could be anything that makes decisions, as a person, firm, machine, or software, it carries out an action with best outcome after considering past and current percepts. An AI system is composed of an agent and its environment. The agents act in their environment. The environment may contain other agents.

A rational agent is essentially a goal based agent. It assesses its environment by considering what it is like. It then looks at each available actions in its environment and determines how it will affect the environment and help it attain its goal. It tries out all the possible steps before choosing the best one, the one that will move it closest to its objective.

eg:- a vacuum cleaner

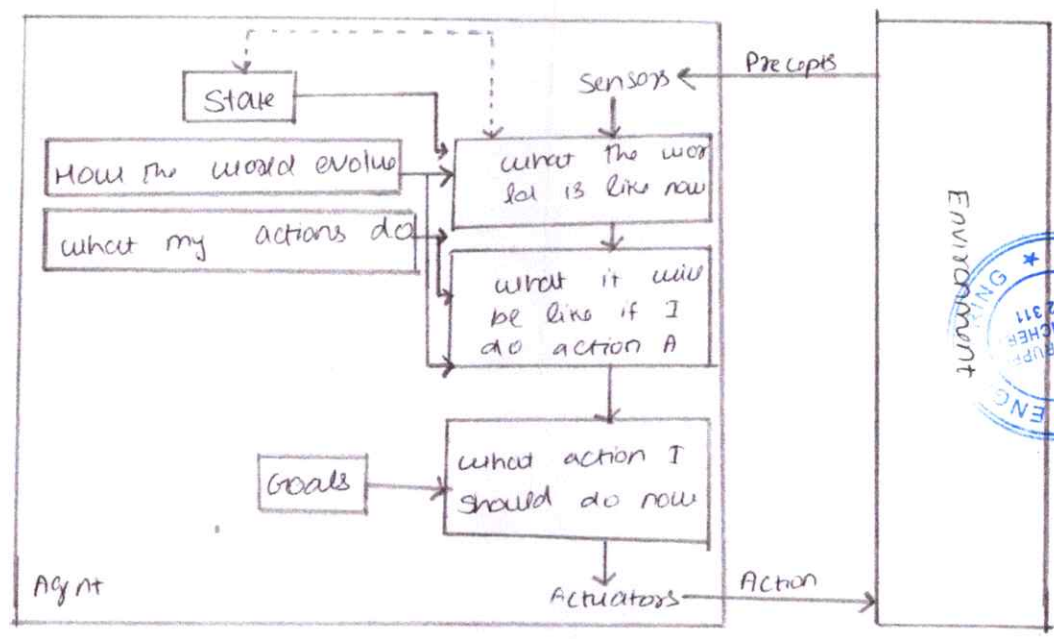


A rational agent is an agent which has clear preferences, models uncertainty, and acts in a way to maximize its performance measure with all possible actions. A rational agent is said to perform the right things. Rational agents in AI are very similar to intelligent agents.

3) Explain the structure of goal-based agents and utility-based agent with diagrams

Goal-based agents

- The knowledge of the current state environment is not always sufficient to decide for an agent to what to do
- The agent needs to know its goal which describes desirable situations.
- Goal-based agents expand the capabilities of the model-based agent by having the "goal" information
- They choose an action, so that they can achieve the goal.
- They agents may have to consider a long sequence of possible actions before deciding whether the goal is achieved or not. Such consideration of different scenarios are called searching and planning, which makes an agent proactive



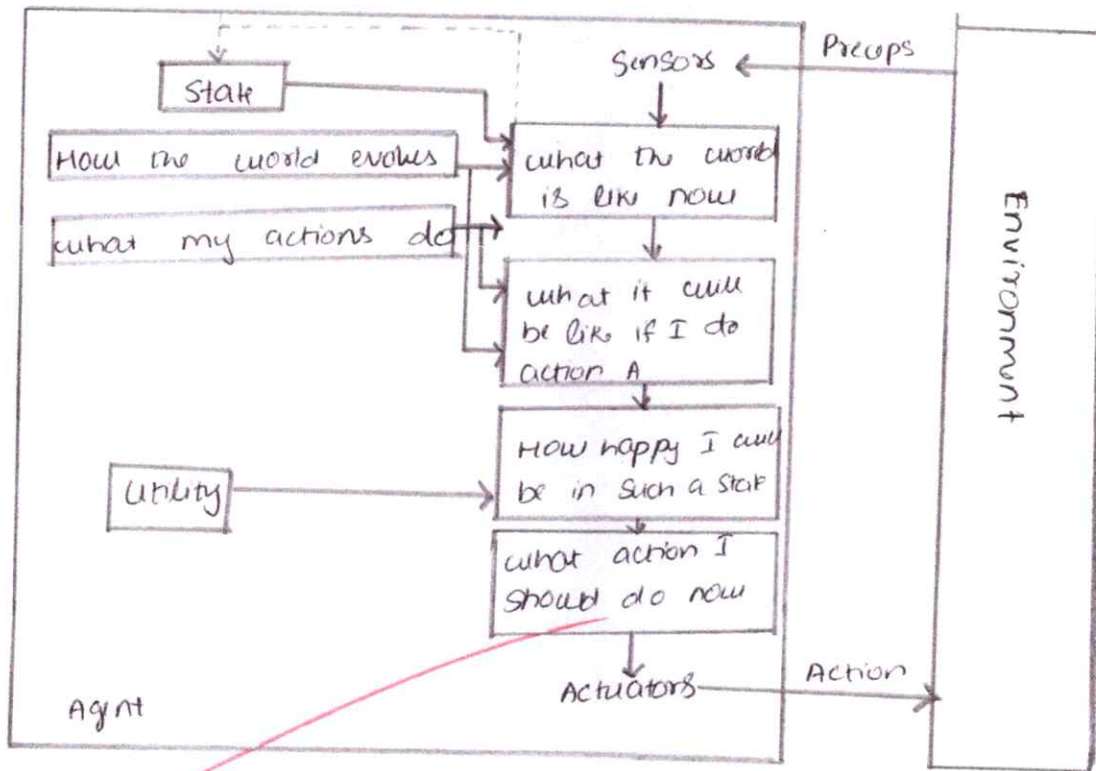
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Utility-based agents

- These agents are similar to the goal-based agent but provide an extra component of utility measurement which makes them different by providing a measure of success at a given state.
- Utility-based agents act based not only goals but also the best way to achieve the goal.
- The utility-based agent is useful when there are multiple possible alternatives, and an agent has to choose in order to perform the best action.
- The utility function maps each state to a real number to check how efficiently each action achieves the goals.



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CST 401	Artificial Intelligence (2022-2023)
AY 2022-2023 ODD SEM	S7 A&B 2019-2023 BATCH

Name of the Student Centric Teaching Method	Experiential Learning/problem solving/participatory/ICT
Title of the Activity	PPT with videos
Department	CSE
Program	BTech
Semester	S7
DATE	2022-2023 odd semester

With the old Chalk and Talk method, it is difficult to effectively convey many of the concepts and algorithms in AI. Information and Communication Technology (ICT) can play a crucial role in implementing a student-centric approach to teaching and learning in the subject of Artificial Intelligence (AI).

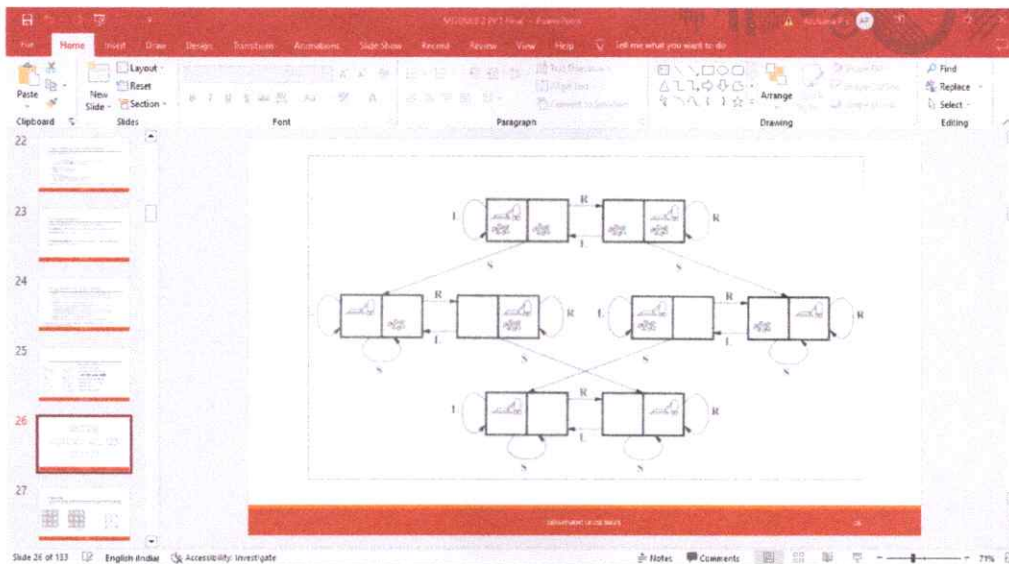
1. PPT were used to understand the concept of different toy problems in AI

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Click to add title

- Number of states: 8
- Initial state: Any
- Number of actions: 4
 - left, right, suck, noOp
- Goal: clean up all dirt
- Goal states: {7, 8}
- Path Cost:
 - Each step costs 1



8-puzzle

A tile adjacent to the blank space can slide into the space. The object is to reach a specified goal state

7	2	4
5		6
8	3	1

Start state

	1	2
3	4	5
6	7	8

Goal state

1	2	
3	4	5
6	7	8

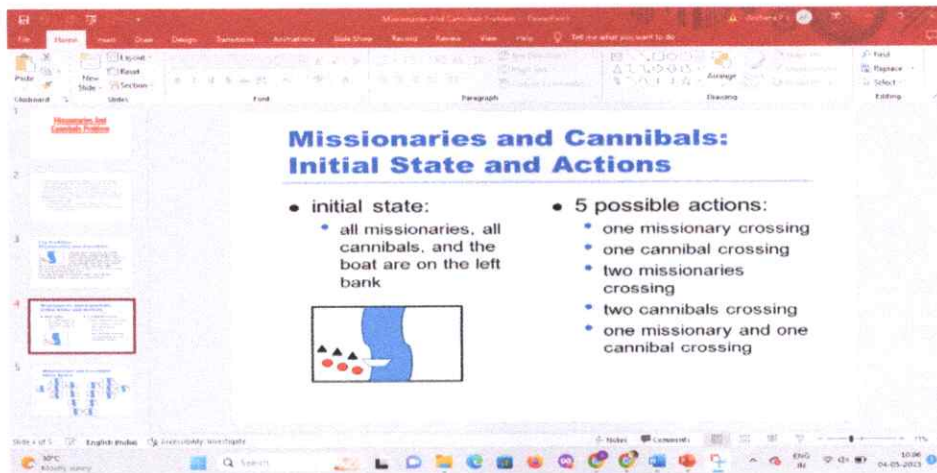
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2. For better understanding of 8 puzzle problem GIF solutions are used

1	2	5
3	4	
6	7	8

3. PPT with video were used to demonstrate Missionaries and cannibal problem.

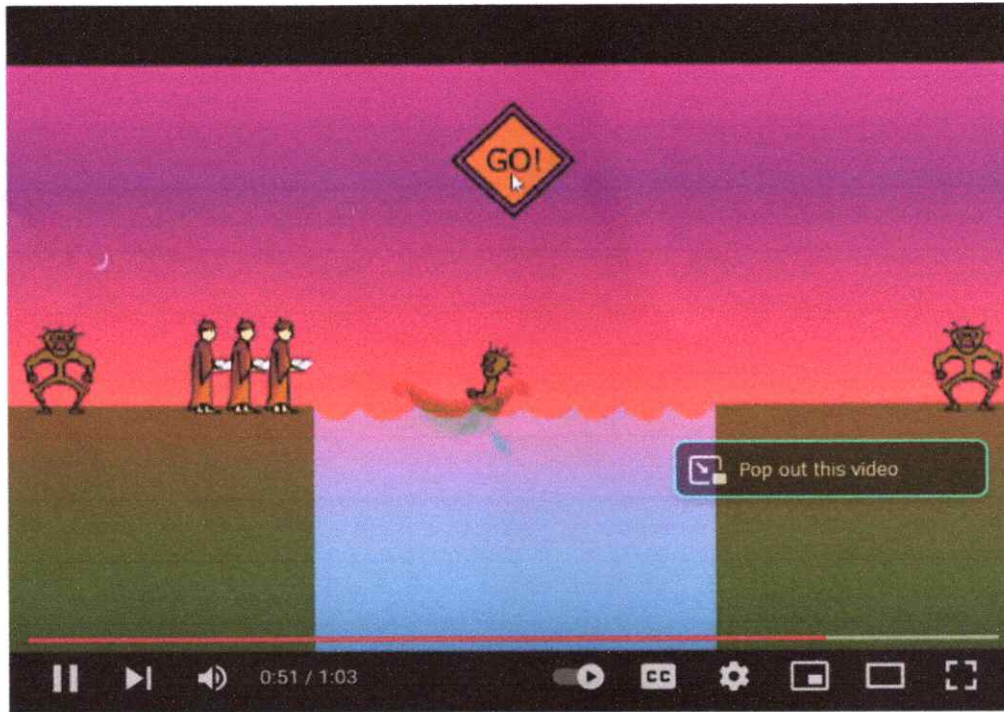


Animated video link used:

<https://youtu.be/laLS8gHzROg>

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