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| Logo_MEC  **2021-2022**  **MUST KNOW CONCEPTS**  **IT** | **MUTHAYAMMAL ENGINEERING COLLEGE**  **(An Autonomous Institution)**  **(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)**  **Rasipuram - 637 408, Namakkal Dist., Tamil Nadu** | **MKC** |

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| **Course Code & Course Name** | **:** | **19ITC17 & Artificial intelligence** |
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**Year/Sem/Sec : III/V/-**

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| **UNIT- I: INTRODUCTION TO AI AND PRODUCTION SYSTEMS** | | | | | | | | | |
| **S.No** | | | **Term** | | **Notation**  **Symbol)** | | **Concept/Definition/Meaning/Units/Equation/Expression** | | **Units** |
|  | | | AI | |  | | Artificial Intelligence is the study of how to make computers do things which at the moment people do better. | |  |
|  | | | AI Problem | |  | | A problem is really a collection of information that the agent will use to decide what to do. | |  |
|  | | | Problem formulation | |  | | Problem formulation is the process of deciding what actions and states to consider for a goal that has been developed in the first step of problem solving. | |  |
|  | | | Four components of a problem | |  | | 1.An initial state.  2.Actions.  3.Goal test.  4. Path cost. | |  |
|  | | | Production  system | |  | | The process of solving the problem can usefully be modeled as a production system. | |  |
|  | | | BFS | |  | | BFS means breath wise search | |  |
|  | | | DFS | |  | | DFS means depth wise search | |  |
|  | | | Heuritstic function | |  | | A heuritstic function is a function that maps from problem state description to measures of desirability, represented as numbers | |  |
|  | | | Monotonic production system | |  | | A monotonic production system is a system on which the application of a rule never prevents the later application of another rule that could also have been applied at that time the first rule was selected | |  |
|  | | | Commutative production system | |  | | A commutative production system is a production system that is both monotonic and partially commutative | |  |
|  | | | Hill climbing | |  | | Hill climbing is a variant of generate and test in which the feedback from the test procedure is used to help the generator decide which direction to move in the search space | |  |
|  | | | CSP | |  | | A constraint satisfaction problem is a special kind of problem satisfies some additional structural properties beyond the basic requirements for problem in general.The states are defined by the values of a set of variables and the goal test specifies a set of constraint that the value must obey. | |  |
|  | | | Applications of AI | |  | | 1. Autonomous planning and scheduling 2. Game playing 3. Autonomous control 4. Diagnosis 5. Logistics planning 6. Robotics | |  |
|  | | | Search strategy Criteria’s | |  | | a.Completeness  b.Time complexity  c. Space complexity  d.Optimality | |  |
|  | | | Constraint graph | |  | | It is helpful to visualize the Constraint Satisfaction Problem as a Constraint Graph. A Consraint Graph is a graph where the nodes of the graph corresponds to variables of the problem and the arcs corresponds to constraints | |  |
|  | | | List of uninformed search techniques | |  | | 1. Breadth-First Search(BFS). 2. Depth-First Search(DFS). 3. Uniform Cost Search. 4. Depth Limited Search. 5. Iterative Deepening Search. 6. Bidirectional Search | |  |
|  | | | Generality” in AI | |  | | Generality is the measure of ease with which the method can be adapted to different domains of application | |  |
|  | | | A\* algorithm | |  | | A\* algorithm is based on best first search method, as it gives an idea of optimization and quick choose of path, and all characteristics lie in A\* algorithm | |  |
|  | | | Agent | |  | | An agent is anything that can be viewed as perceiving its environment through Sensors and acting upon the environment through effectors. | |  |
|  | | | Depth Limited Search | |  | | Depth-limited avoids the pitfalls of DFS by imposing a cut off of the maximum depth of a path. This cutoff can be implemented by special depth limited search algorithm or by using the general search algorithm with operators that keep track of the depth | |  |
|  | | | Iterative deepening | |  | | Iterative deepening is a strategy that sidesteps the issue of choosing the best depth limit by trying all possible depth limits: first depth 0, then depth 1, then depth 2& so on | |  |
|  | | | List down the characteristics of intelligent agent | |  | | Learning/reasoning Autonomy Goal oriented | |  |
|  | | | Local maximum | |  | | Local maximum is a peak that is higher than each of its neighboring states but lower than the global maximum | |  |
|  | | | State-space search technique | |  | | State space search involves the use of a graph to keep track of the relationships between states. Each node of the graph represents a state of the problem. | |  |
|  | | | Bidirectional search | |  | | The idea behind bidirectional search is to simultaneously search both forward from the initial state & backward from the goal & stop when the two searches meet in the middle. | |  |
| **UNIT- II:- REPRESENTATION OF KNOWLEDGE** | | | | | | | | | |
|  | | First-order logic | |  | | The first-order logic is sufficiently expressive to represent a good deal of our recommonsense knowledge. It also either subsumes or forms the foundation of many other representation languages | | |  |
|  | | symbol | |  | | The basic syntactic elements of first-order logic are the symbols. It stands for objects, relations and functions | | |  |
|  | | Types of Quantifiers | |  | | Universal Quantifiers.  Existential Quantifiers | | |  |
|  | | Logic | |  | | A formal language which is used to represent the knowledge in which  reasoning is carried out to achieve the goal state | | |  |
|  | | Sentence | |  | | Each individual representation of facts is called a sentence. The sentences are  expressed in a language called as knowledge representation language | | |  |
|  | | Proof | |  | | A sequence of application of inference rules is called a proof. Finding proof  is exactly finding solution to search problems. If the successor function is defined to generate all possible applications of inference rules then the search algorithms can be applied to find proofs | | |  |
|  | | Syntax | |  | | Syntax is the arrangement of words. Syntax of knowledge describes the  possible configurations that can constitute sentences. Syntax of the language  describes how to make sentences | | |  |
|  | | Semantics | |  | | The semantics of the language defines the truth of each sentence with respect  to each possible world. With this semantics, when a particular configuration exists within an agent, the agent believes the corresponding sentence | | |  |
|  | | Modus Ponen’s rule in Propositional logic | |  | | The standard patterns of inference that can be applied to derive chains of  conclusions that lead to the desired goal is said to be Modus Ponen’s rule. | | |  |
|  | | Knowledge base | |  | | Knowledge base is the central component of knowledge base agent and it is  described as a set of representations of facts about the world | | |  |
|  | | WFF | |  | | The Well Formed Formula (WFF) is a sentence in which all their variables  are properly introduced with the quantifier in the beginning of the sentence itself, is called WFF | | |  |
|  | | Horn Clause | |  | | Horn clause is a clause with at most one positive literal in the clause.  Example : P ∨ ⌐Q | | |  |
|  | | KR | |  | | Knowledge representation (KR) is an area of artificial intelligence research  aimed at representing knowledge in symbols to facilitate inferencing from those knowledge elements, creating new elements of knowledge | | |  |
|  | | Unification | |  | | A matching procedure that compares two literals and discovers whether there exists a set of substitutions that makes them identical. This straightforward procedure is called Unification | | |  |
|  | | Resolution | |  | | Resolution is a procedure that gains its efficiency from the fact that it operates on statements that have been converted to a very convenient standard form. Resolution produces proofs by refutation | | |  |
|  | | Skolemization | |  | | Process of removing Universal quantifier is called as skolemization | | |  |
|  | | Components of aPredicate logic | |  | | Terms, Predicates and Quantifiers are the components of Predicate Logic | | |  |
|  | | types of Matching | |  | | * Indexing * Matching with variables * Complex and Approximate Matching * Conflict Resolution | | |  |
|  | | forward chaining | |  | | Forward chaining or data-driven inference works by repeatedly: starting from the current state, matching the premises of the rules (the IF parts), and performing the corresponding actions (the THEN parts) that usually update the knowledge base or working memory. | | |  |
|  | | Backward chaining | |  | | Backward chaining or goal-driven inference works towards a final state by looking at the working memory to see if the sub-goal states already exist there. If not, the actions (the THEN parts) of the rules that will establish the sub-goals are identified, and new sub-goals are set up for achieving the premises of those rules (the IF parts) | | |  |
|  | | CF | |  | | A **certainty factor** (CF) is a numerical value that expresses a degree of subjective belief that a particular item is true. The item may be a fact or a rule. When probabilities are used attention must be paid to the underlying assumptions and probability distributions in order to show validity. Bayes’ rule can be used to combine probability measures | | |  |
|  | | Fuzzy Reasoning | |  | | Fuzzy Reasoning is based on the theory of fuzzy sets and it encompasses Artificial Intelligence, information processing and theories from logic to pure and Applied mathematics, like graph theory, topology and optimization | | |  |
|  | | Frame-based representation | |  | | A frame-based representation facility contributes to a knowledge system’s ability to reason and can assist the system designer in determining strategies for controlling the system’s reasoning. | | |  |
|  | | Truth preserving | |  | | An inference algorithm that derives only entailed sentences is called sound or truth preserving . | | |  |
|  | | Interpretation | |  | | Interpretation specifies exactly which objects, relations and functions are reffered to by the constant predicate, and function symbols | | |  |
| **UNIT -III : MACHINE LEARNING** | | | | | | | | | |
|  | Machine learning | | |  | | | | Machine learning is a branch of computer science which deals with system programming in order to automatically learn and improve with experience. For example: Robots are programed so that they can perform the task based on data they gather from sensors. It automatically learns programs from data. 2 |  |
|  | Overfitting’ in Machine learning | | |  | | | | In machine learning, when a statistical model describes random error or noise instead of underlying relationship ‘overfitting’ occurs. When a model is excessively complex, overfitting is normally observed, because of having too many parameters with respect to the number of training data types. The model exhibits poor performance which has been overfit |  |
|  | Inductive machine learning | | |  | | | | The inductive machine learning involves the process of learning by examples, where a system, from a set of observed instances tries to induce a general rule. |  |
|  | five popular algorithms of Machine Learning | | |  | | | | a)Decision Trees  b) Neural Networks (back propagation)  c) Probabilistic networks  d) Nearest Neighbor  e) Support vector machines |  |
|  | Algorithm techniques in Machine Learning | | |  | | | | a) Supervised Learning b) Unsupervised Learning c) Semi-supervised Learning d) Reinforcement Learning e) Transduction f) Learning to Learn |  |
|  | Standard approach to supervised learning | | |  | | | | The standard approach to supervised learning is to split the set of example into the training set and the test |  |
|  | Training set’ and ‘Test set’ | | |  | | | | In various areas of information science like machine learning, a set of data is used to discover the potentially predictive relationship known as ‘Training Set’. Training set is an examples given to the learner, while Test set is used to test the accuracy of the hypotheses generated by the learner, and it is the set of example held back from the learner. Training set are distinct from Test set. |  |
|  | Function of ‘Unsupervised Learning’ | | |  | | | | a) Find clusters of the data  b) Find low-dimensional representations of the data  c) Find interesting directions in data  d) Interesting coordinates and correlations  e) Find novel observations/ database cleaning |  |
|  | Supervised Learning’ | | |  | | | | a) Classifications  b) Speech recognition  c) Regression  d) Predict time series  e) Annotate strings |  |
|  | Inductive Logic Programming | | |  | | | | Inductive Logic Programming (ILP) is a subfield of machine learning which uses logical programming representing background knowledge and examples. |  |
|  | Ensemble learning | | |  | | | | Ensemble learning is used when you build component classifiers that are more accurate and independent from each other |  |
|  | PCA | | |  | | | | Principal Components Analysis. |  |
|  | KPCA | | |  | | | | Kernel based Principal Component Analysis |  |
|  | ICA | | |  | | | | Independent Component Analysis are important feature extraction techniques used for dimensionality reduction |  |
|  | Support vector machine | | |  | | | | Support vector machines are supervised learning algorithms used for classification and regression analysis. |  |
|  | PAC | | |  | | | | Probably Approximately Correct- learning is a learning framework that has been introduced to analyze learning algorithms and their statistical efficiency |  |
|  | Sequence learning | | |  | | | | Sequence learning is a method of teaching and learning in a logical manner |  |
|  | Major techniques of Machine Learning | | |  | | | | The two techniques of Machine Learning are a) Genetic Programming  b) Inductive Learning |  |
|  | Fuzzification and Defuzzification | | |  | | | | Fuzzification It is the conversion of crisp quantity into fuzzy quantity. Defuzzification It is the conversion of a fuzzy quantity into crisp quantity. |  |
|  | ANN | | |  | | | | Artificial Neural Network is information processing devices with the capability of performing computations similar to human brain or biological neural network. |  |
|  | Applications of neural networks | | |  | | | | Used in medical field Used in telephone communication Business applications |  |
|  | BPN | | |  | | | | Back Propagation Network (BPN). It is a multi-layer forward network used extend gradient-descent waste delta learning rule |  |
|  | ADALINE | | |  | | | | ADALINE is Adaptive Linear Neural Element. |  |
|  | Feedback networks | | |  | | | | feedback networks, which can return back the output to the input, thereby giving rise to an iteration process, are defined as feedback networks. |  |
|  | List the operations on fuzzy relations | | |  | | | | Union μRUS (x,y)=max(μR(x,y), μS(x,y))  Intersection μR\_S (x,y)=min(μR(x,y), μS(x,y))  Complement μR(x,y)= 1- μR(x,y)  Containment R S=>μR(x,y) \_μS(x,y) |  |
| **UNIT- IV: GENETIC ALGORITHMS** | | | | | | | | | |
|  | | | Genetic Algorithms |  | | | | Genetic Algorithms(GAs) are adaptive heuristic search algorithms that belong to the larger part of evolutionary algorithms. Genetic algorithms are based on the ideas of natural selection and genetics |  |
|  | | | **Operators of Genetic Algorithms** |  | | | | **1. Selection Operator** **2. Crossover Operator**  3. **Mutation Operator:** |  |
|  | | | **Why use Genetic Algorithms** |  | | | | * They are Robust * Provide optimisation over large space state. * Unlike traditional AI, they do not break on slight change in input or presence of noise |  |
|  | | | Application of Genetic Algorithms |  | | | | * Recurrent Neural Network * Mutation testing * Code breaking * Filtering and signal processing * Learning fuzzy rule base etc |  |
|  | | | Genetic programming |  | | | | Genetic programming is one of the two techniques used in machine learning. The model is based on the testing and selecting the best choice among a set of results. |  |
|  | | | Holland's schema theorem |  | | | | Holland's schema theorem, also called the fundamental theorem of genetic algorithms,[[1]](https://en.wikipedia.org/wiki/Holland%27s_schema_theorem#cite_note-1) is an inequality that results from coarse-graining an equation for [evolutionary dynamics](https://en.wikipedia.org/wiki/Evolutionary_dynamics) |  |
|  | | | A cognitive map |  | | | | A cognitive map is a mental picture or image of the layout of one's physical environment |  |
|  | | | Visual perception |  | | | | Visual perception is the ability to see, organize, and interpret one's environment. |  |
|  | | | popular of GA factors |  | | | | 1.Concept is easy to understand  2.Modular  3.Good for “noisy” environments  4.Always an answer; answer gets better with time  5. State easily distributed  6.Inherently parallel; |  |
|  | | | Selection methods in GA |  | | | | 1. Roulette Wheel selection,  2. Boltzman selection,  3. Tournament selection  4. Rank selection  5. Staedy state selection. |  |
|  | | | Advantages of GA |  | | | | 1.Many ways to speed  2.Easy to exploit previous or alternate solutions  3.Flexible building blocks for hybrid applications  4.Substantial history and range of use |  |
|  | | | limitations of GA |  | | | | The limitations of genetic programming lie in the huge search space the GAs have to search for - an infinite number of equations. |  |
|  | | | TABU search |  | | | | Tabu search is a local search method used for mathematical optimization. Local searches take a potential solution to a problem and check its immediate neighbors in the hope of finding an improved solution |  |
|  | | | Application of Ant Colony Search |  | | | | 1 Scheduling problem  2 Vehicle routing problem  3 Assignment problem4 Set problem |  |
|  | | | Associative memory |  | | | | A neural net that is trained to associate a set of input vectors with a corresponding set of output vectors is called associative memory. |  |
|  | | | Why Hopfield network is called as recurrent neural network? |  | | | | Hopfield nets serve as content-addressable memory systems with binary threshold nodes. They are guaranteed to converge to a local minimum, but convergence to a false pattern (wrong local minimum) rather than the stored pattern (expected local minimum) can occur. Hopfield networks also provide a model for understanding human memory. |  |
|  | | | stability-plasticity dilemma |  | | | | A learning agent should be plastic, or adaptive in reacting to changing environments mean while it should be stable to preserve knowledge acquired previously. |  |
|  | | | Properties of adaptive resonance theory |  | | | | An ART system has four basic properties. The first is the self-scaling computational units. The attentional subsystem is based on competitive learning enhancing pattern features but suppressing noise. The second is self-adjusting memory search. The system can search memory in parallel and adaptively change its search order. Third, already learned patterns directly access their corresponding category. Finally, the system can adaptively modulate attentional vigilance using the environment as a teacher. |  |
|  | | | Simulated annealing |  | | | | Simulated annealing (SA) is a generic probabilistic meta heuristic for the global optimization problem of locating a good approximation to the global optimum of a given function in a large search space. It is often used when the search space is discrete |  |
|  | | | Computational neuroscience |  | | | | Computational neuroscience describes the nervous system through computational models. Although this research program is grounded in mathematical modeling of individual neurons, the distinctive focus of computational neuroscience is systems of interconnected neurons. |  |
|  | | | Computational theory |  | | | | Computational theory is the device is characterized as a mapping from one kind of information to another, the abstract properties of this mapping are defined precisely, and its appropriateness and adequacy for the task as hand are demonstrated |  |
|  | | | Cross-over operation |  | | | | Cross over is the recombination operation where two strings and a cross over site are selected to swap the to produce next set of solutions. |  |
|  | | | Steps of Tabu search |  | | | | 1. Neighborhood structure/Move mechanism, 2. Move Attribute (used for Tabu classification)3. Tabu status and duration (tenure) 4.Aspiration criteria5. Stopping criteria |  |
|  | | | FLC |  | | | | FLC is Fuzzy logic Controller where a rule base is formed by an expert for agiven problem and a suitable solut arrived at using an inferen ion is ce engine. |  |
|  | | | System optimization |  | | | | This cane defined as a broad set of interrelated decisions on obtaining, operating, and maintaining physical and human resources for electricity generation, transmission, and distribution that minimize the total cost of providing electric power to all classes of consumers, subject to engineering, market, and regulatory constraints. |  |
| **UNIT-V: EXPERT SYSTEMS** | | | | | | | | | |
|  | | Expert System or Knowledge Based System | |  | | | | Expert system is a computer system that emulates the decision-making ability of a human expert. Expert systems are designed to solve complex problems by reasoning about knowledge, represented primarily as if–then rules rather than through conventional procedural code. |  |
|  | | Inference engine | |  | | | | Inference engine that consists of algorithms for manipulating the knowledge represented in the knowledge base to solve a problem presented to the system |  |
|  | | Roles of Expert system | |  | | | | Domain expert :The individuals who currently are experts in solving the problems; here the system is intended to solve;  Knowledge engineer :The individual who encodes the expert's knowledge in a declarative form that can be used by the expert system;  User : The individual who will be consulting with the system to get advice which would have been provided by the expert. |  |
|  | | Expert System Shells | |  | | | | Expert systems are built with products called expert system shells. A shell is a piece of software which contains the user interface, a format for declarative knowledge in the knowledge base, and an inference engine. The knowledge and system engineers uses these shells in making expert systems |  |
|  | | Expert System Characteristics | |  | | | | 1.Operates as an interactive system  2. Tools have ability to sift (filter) knowledge  3. Make logical inferences based on knowledge  stored  4. Ability to Explain Reasoning  5. Domain-Specific  6. Capability to assign Confidence Values  7. Cost-Effective alternative to Human Expert |  |
|  | | Application of Expert Systems | |  | | | | * Diagnosis and Troubleshooting of Devices and Systems * Planning and Scheduling * Configuration of Manufactured Objects from sub-assemblies * Financial Decision Making * Knowledge Publishing * Process Monitoring and Control * Design and Manufacturing |  |
|  | | List major components of an ES | |  | | | | \*Knowledge base-the software that represents  the knowledge.  \* Inference engine-the reasoning mechanism.  \* User interface-the hardware and software that  provide the dialogue between people and the computer |  |
|  | | Rule-based ES | |  | | | | Knowledge is represented by a series of rules |  |
|  | | Frame-based systems | |  | | | | Knowledge is represented as a series of frames (an object-oriented approach). |  |
|  | | Hybrid systems | |  | | | | Involve several approaches such as fuzzy logic and neural networks. |  |
|  | | Model-based systems | |  | | | | Structured around a model that simulates the structure and function of the system under study. Ready-made systems Utilize prepackaged software |  |
|  | | Real-time systems | |  | | | | Systems designed to produce a just-in-time response |  |
|  | | Meta knowledge | |  | | | | Meta knowledge can be simply defined as knowledge about knowledge. it use and control of domain knowledge in an expert system. |  |
|  | | MYCIN | |  | | | | MYCIN was the first large expert system to perform at the level of a human expert and to provide users with an explanation of its reasoning |  |
|  | | DART | |  | | | | DART uses intelligent agents to aid decision support system .It integrates a set of intelligent data processing agent and data base management system to give planners the ability to rapidly evaluate plans for logistically feasibility. Dart decreases the cost and time required to implement decisions |  |
|  | | Domain Expert | |  | | | | Domain expert--the individual who is considered an expert. |  |
|  | | Knowledge engineer | |  | | | | The individual who acquires and represents the knowledge. |  |
|  | | Explanation facility | |  | | | | The software that answers questions such as "Why" and “How." |  |
|  | | Blackboard | |  | | | | Workplace for storing and working on intermediate information. |  |
|  | | Reasoning improvement | |  | | | | Facility (not available commercially) for improving the reasoning capabilities of an ES |  |
|  | | [Activation function](https://en.wikipedia.org/wiki/Activation_function) | |  | | | | In [artificial neural networks](https://en.wikipedia.org/wiki/Artificial_neural_network), the activation function of a node defines the output of that node given an input or set of inputs. |  |
|  | | [Augmented reality](https://en.wikipedia.org/wiki/Augmented_reality) | |  | | | | (AR) is an interactive experience of a real-world environment where the objects that reside in the real-world are "augmented" by computer-generated perceptual information, sometimes across multiple sensory modalities,including [visual](https://en.wikipedia.org/wiki/Visual), [auditory](https://en.wikipedia.org/wiki/Hearing), [haptic](https://en.wikipedia.org/wiki/Haptic_perception), [somatosensory](https://en.wikipedia.org/wiki/Somatosensory_system), and [olfactory](https://en.wikipedia.org/wiki/Olfactory) |  |
|  | | [Backward chaining](https://en.wikipedia.org/wiki/Backward_chaining) | |  | | | | Backward reasoning) is an [inference](https://en.wikipedia.org/wiki/Inference) method described colloquially as working backward from the goal. It is used in [automated theorem provers](https://en.wikipedia.org/wiki/Automated_theorem_prover), [inference engines](https://en.wikipedia.org/wiki/Inference_engine), [proof assistants](https://en.wikipedia.org/wiki/Proof_assistant), and other [artificial intelligence](https://en.wikipedia.org/wiki/Artificial_intelligence)applications |  |
|  | | [Chatbot](https://en.wikipedia.org/wiki/Chatbot) –smartbots, talkbot, chatterbot, Bot, IM bot, | |  | | | | interactive agent, Conversational interface or Artificial Conversational Entity) is a [computer program](https://en.wikipedia.org/wiki/Computer_program) or an [artificial intelligence](https://en.wikipedia.org/wiki/Artificial_intelligence) which conducts a [conversation](https://en.wikipedia.org/wiki/Conversation) via auditory or textual methods |  |
|  | | [Game theory](https://en.wikipedia.org/wiki/Game_theory) | |  | | | | The study of [mathematical models](https://en.wikipedia.org/wiki/Mathematical_model) of strategic interaction between rational decision-makers |  |
| **PLACEMENT QUESTIONS** | | | | | | | | | |
|  | | | Means-end analysis |  | | | | The problem space of means-end analysis has an initial state and one or more goal states |  |
|  | | | Cybernetics |  | | | | Cybernetics is Study of communication between human and machine. |  |
|  | | | Traveling salesman problem |  | | | | The traveling salesman problem involves n cities with paths connecting the cities. The time taken for traversing through all the cities, without knowing in advance the length of a minimum tour, is O(n) |  |
|  | | | All dogs have tails |  | | | | ۷x: dog(x)hastail(x).(FOL Representation) |  |
|  | | | Idempotency law |  | | | | Idempotency Law is P V P = P |  |
|  | | | Utility based agent |  | | | | Utility based agent with happy and unhappy state in artificial intelligence. |  |
|  | | | Pragmatic |  | | | | High level knowledge which relates to the use of sentences in different contexts and how the context affect the meaning of the sentences |  |
|  | | | unification, substitution |  | | | | The objective of unification procedure is to discover at least one substitution that causes two literals to match |  |
|  | | | Associative Network |  | | | | Directed graph with labelled nodes for graphical representation of knowledge |  |
|  | | | Conceptual Dependencies |  | | | | Primitive concepts and rules to represent natural language statements |  |
|  | | | Frames |  | | | | Frame like structures used to represent stereotypical patterns for commonly                   occurring events in terms of actors, roles, props and scenes |  |
|  | | | Script |  | | | | Knowledge about objects and events is stored in record-like structures consisting of slots and slot values. |  |
|  | | | Supervised learning |  | | | | Manual labels of inputs are used |  |
|  | | | Unsupervised  learning |  | | | | Manual labels of inputs are not used |  |
|  | | | Reinforcement learning |  | | | | The decision system receives rewards for its action at the end of a sequence of steps. |  |
|  | | | Inductive learning |  | | | | System learns by example |  |
|  | | | Turing Test |  | | | | The imitation game by its creator |  |
|  | | | Natural language processing |  | | | | |  |  | | --- | --- | |  | Natural language processing can be divided into the two subfields of generation and understanding | | |  |
|  | | | Strong AI |  | | | | |  | | --- | | Strong AI is the embodiment of human intellectual capabilities within a computer. | | |  |  | | --- | --- | |  |  | | |  |
|  | | | human factors |  | | | | Investigating the improvement of the relationship between people and computers through a technology |  |
|  | | | IPL |  | | | | The first AI programming language was called |  |
|  | | | Simulation |  | | | | One method of programming a computer to exhibit human intelligence is called modeling or simulation |  |
|  | | | Manipulator |  | | | | A robot's "arm" is also known as Manipulator |  |
|  | | | Symbols |  | | | | One definition of AI focuses on problem-solving methods that process |  |
|  | | | ART |  | | | | Automatic Reasoning Tool is designed to be used on LISP machines |  |

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| **Faculty Team Prepared** | | **Signatures** |  |
|  | **P.Bhuvaneshwari** |  |
|  |  |  | **HoD** |