

UNIT - 01

Artificial Intelligence & Knowledge Representation,

Course Outcomes : →

Student will be able to -

CO1 → Understand basic building Block of AI & KR

CO2 → Apply propositional logic for KR

CO3 → Design various models based on ML methods Apply

CO4 → Design various models based on Deep learning methodology Apply

CO5 → Understand various hardware & sw aspect used for AI & its application.

Humans are best at understanding, reasoning & interpreting knowledge. Human knows things, which is knowledge & as per their knowledge they perform various actions in the real world. But how mlc do all these things comes under knowledge representation & reasoning.

AI is composed of two words -

Artificial → man made.

Intelligence → Thinking power.

Hence "AI means man made thinking power."

So we can define AI as:

"It is a branch of computer science by which we can intelligent machines which can behave like a human, think like humans & able to make decision."

Following are the kind of knowledge which needs to be represented in AI system.

- object
- events
- performance
- Meta knowledge
- facts.
- knowledge Base.

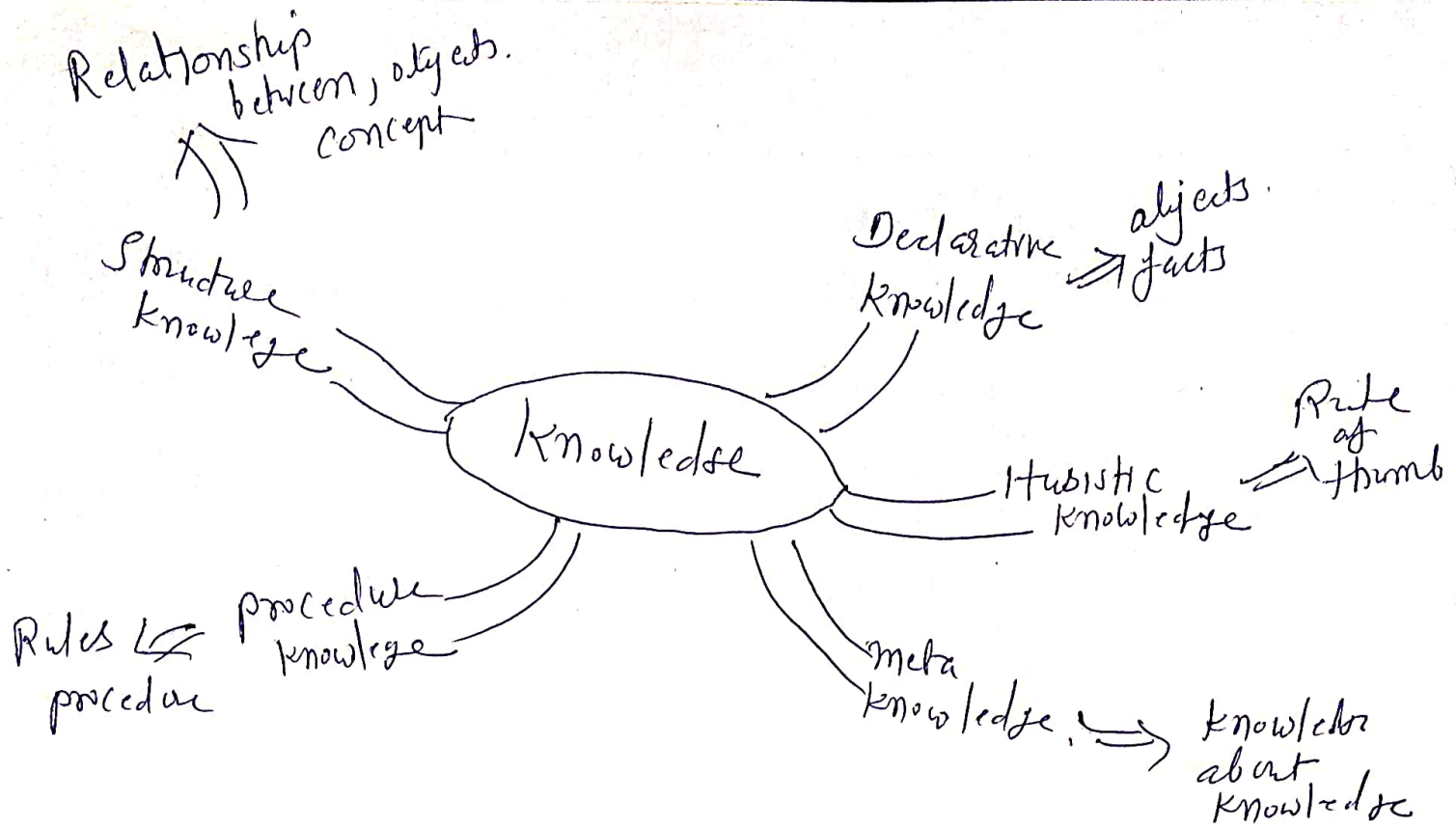
Knowledge is awareness or familiarity gained by experience of facts, data & situation.

Following are the types of knowledge in AI.

Types of knowledge →

Following are the various types of knowledge →

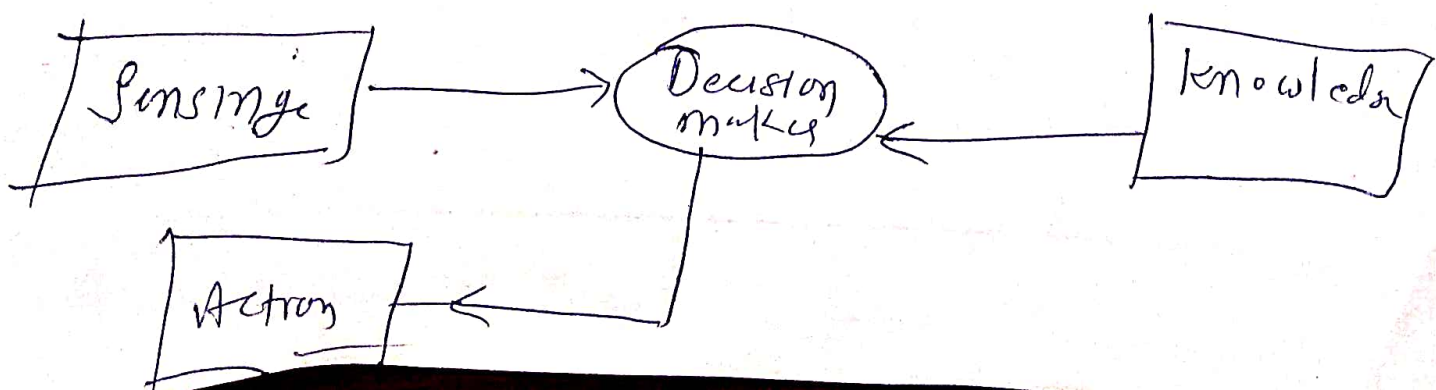
- 1 - Declarative knowledge
- 2 - procedure knowledge
- 3 - meta knowledge
- 4 - Heuristic knowledge
- 5 - structural knowledge.



The relation between knowledge & intelligence : →

Knowledge of real-worlds plays a vital role in intelligence & same for creating AI. Knowledge plays an important role in demonstrating intelligence behaviour in AI agents. An agent is only able to accurately act on some input when he has some knowledge or experience about that input.

Lets suppose if you met some person who is speaking to a language which you don't then how you will able to act on that. The same thing applies to the intelligent behavior of the agents



Problem Solving, Search Strategies -

- General problem -
- Search & Control Strategies
- Exhaustive Searches.
- Heuristic Search.
- Constraint Satisfaction problems.

Knowledge representation : →

KR using predicate logic : → Logic as language, logic as representation, propositional logic, statements, Variables, Symbols, truth value.

KR using Rules : → Types of Rules → declarative, procedural, meta rules, procedural versus declarative knowledge & language.

Reasoning System →

- Reasoning
- Symbolic Reasoning
- Statistical Reasoning.

Game Theory →

- Overview.
- Mini-Max Search procedure,
- Game playing with Mini-Max Example.

Learning Theory Systems →

- What is Learning
- Rote Learning
- Learning by Example
- Explanation Based Learning
- Clustering
- Analogy
- Reinforcement

Expert Systems

- Introduction
- Knowledge Acquisition
- Knowledge Base
- Working memory
- Inference Engine
- Expert System
- Explanation
- Application of Expert Syst.

Neural Networks

- Introduction
- Model of Artificial Neuron
- Neural Network Architecture
- Learning methods in neural Network
- Single Layer NN System
- Applications of Neural Networks

Fundamentals of Genetic Algorithm

- Introduction
- Encoding
- Operator of genetic Algorithm
- Basic Genetic Algorithm

Natural language processing

- Intro. Natural language
- Syntactic processing
- Semantic & pragmatic

AI Common Sense

- Introduction
- Formalization of Common
- physical world
- Common Sense
- Memory organization