

Artificial Intelligence

① Algorithm

② Data Structure

③ Discrete Mathematics

Computer Program : Program a language.

computer

: million no of switch

□ OFF
□ ON

□ □ □ □ . . . □ □ □ □ → starts when all are 1.

□ □ □ □ . . . □ □ + □ □ □ □ → ~~not start~~ Assembly language.

1 1 0 1
1 0 1 1

$$2 + 4 = 6$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline 1 & 0 \\ \hline \end{array} - \begin{array}{|c|c|c|c|} \hline \square & \square & \square & \square \\ \hline 1 & 0 & 0 & 1 \\ \hline \end{array} - \begin{array}{|c|c|c|} \hline \square & \square & \square \\ \hline 1 & 0 & 0 \\ \hline \end{array} = \begin{array}{|c|c|c|} \hline \square & \square & \square \\ \hline 1 & 1 & 0 \\ \hline \end{array}$$

on off

Machine language : 3 types → 1. Low level : Machine Code 1001

2. Mid " : 1001 → ADD } Assembly language
600
3. High " : GUI MUL

ADD [translator] 1001

(Graphical User Interface)

→ replace + - x / → Mid level language

Command prompt : keyboard fix just and and and 201

+ □ □
compilers bytecode

computer think and fear → Artificial Intelligence.

Data Structure : BFS → Queue → FIFO

DFS → Stack → LIFO

↓ every filter overcame

Advanced Algorithm

↳ A* Search

LISP L



A → H

H

- ① Bag, pendrive
- ② Lunch
- ③ Industrial attachment
- ④ Certificate
- ⑤ 4500

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Academic | Robotics | Biometrics | Brain image processing
Computer interfacing | Data mining (Bioinformatics) | Genetic Engineering

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AI

Definition:- Artificial Intelligence is a branch of computer science which concerned with the design of Intelligence in an artificial device.

Discrete Mathematics : Rules for Inference.

Ex: Nodi is a student of BAUST.
Nitu is " " " "

classmate (Nodi, Nitu).

All man is mortal, Medha is a man, Medha is mortal.
 $\forall \text{ man}(\text{Mortal}) \wedge \text{man}(\text{Medha}) \rightarrow \text{Mortal}(\text{Medha}).$

There are idea in the term of Artificial Intelligence:

- ① Artificial \rightarrow Artificial device.
- ② Intelligence.

Intelligence:- The ability to acquire, understand and apply knowledge.

Ability to exercise thought and reason. reasoning

Properties of Intelligence System :-

- ❑ An intelligence system expected as behave as likely human.
- ❑ An intelligence system expected as possible best manner

Types of AI Problem: Two types of AI Problem.

- ① Common place task
- ② Expert System tasks.

① Common place task :-

Image processing

- ① Human recognition, recognizing object.
- ② Communicating (through Natural language)
- ③ Navigating around obstacle street.

② Expert System task :

- ① Medicine diagnosis.
- ② Solving Mathematical Problem.
- ③ Playing Game chess board.

AI are not ?

- ① Read Human mind, body language.
- ② Read newspaper and summarize above that paper.

Application of AI :

- ① Game Playing.
- ② Speech Recognition → Speech Signal Processing (SSP)
- ③ Worker. ex: Chemical Industry.
- ④ Aviation. ex: ① Auto Pilot.
② Aircra^{control}ft using speech command.
- ⑤ Telecommunication System. ex:
① Satellite.



Sub Area of AI :-

- ① Machine Learning.
- ② Natural language processing.
- ③ Signal processing.
- ④ Robotics.
- ⑤ Perception : Vision & Speech Understanding.
- ⑥ Reasoning and decision Making.
 - ① knowledge Representation.
 - ② Reasoning. (logic / Probability)

Types of knowledge :

- ① Declarative knowledge
- ② Procedural "
- ③ Heuristic "
- ④ Epistemology "
- ⑤ Meta "

C
 procedural
 ↓
 निर्दिष्ट process
 follow करू शुरू
 होश बाटह।
 int main {
 }
 Create table C1
 ↳ non-procedural

① Declarative knowledge :- knowledge express statement fact about the word.

I am a boy.
 We are student

② Procedural knowledge : knowledge represent step to solve a problem.

③ Heuristic knowledge : A special kind of knowledge to solve a problem.
 Ex. $a^2 + 2ab + b^2$.

④ Epistemology knowledge : Epistemology is one kind of way to express nature of existing knowledge.

Ex.

- Ⓐ What type of knowledge
- Ⓑ How efficient of this "
- Ⓒ What necessary of " "

⑤ Meta knowledge : knowledge about knowledge.

Ex. What knowledge we know?
 We are expert about computer science.

Lab

=0=

① Uniformed Search

- ① BFS ④ DFS
- ② Game playing
- ③ 8 Queen Problem
- 3x3 4x4 Puzzle game

1	4	7
2	5	8
3	6	

4	7	8
3		5
1	2	6

④ Informed Search

- ① A* Algorithm
- ② Best first Search
- ③ Heuristic Function.

AI Programming Language : ① Prolog . (reasoning, logic)

$C=R$

② C++

③ Java

④ Python

⑤ LISP (List Processing Language)