Presentation on Artificial Intelligence (AI)

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1. Introduction to Artificial Intelligence (AI)

Definition

Artificial Intelligence (AI) is the branch of computer science that aims to create machines that can perform tasks that require human intelligence.

Examples

Speech Recognition: Siri, Alexa

Self-driving Cars

Image Recognition

Chatbots

Main Focus

Making machines think and act intelligently like humans.

2. Applications of AI

Healthcare

Disease detection, drug discovery

Education

Intelligent tutoring systems

Finance

Fraud detection, stock prediction

Transportation

Self-driving vehicles

Gaming

Intelligent game opponents

Robotics

Industrial automation

3. Goals of AI

1

Reasoning

Make logical decisions

2

Learning

Improve performance through experience

3

Perception

Understand the environment

4

Planning

Achieve goals efficiently

5

Natural Interaction

Communicate using natural language

4. Types of AI Agents

Simple Reflex Agent

Acts only on current percept

Model-Based Reflex Agent

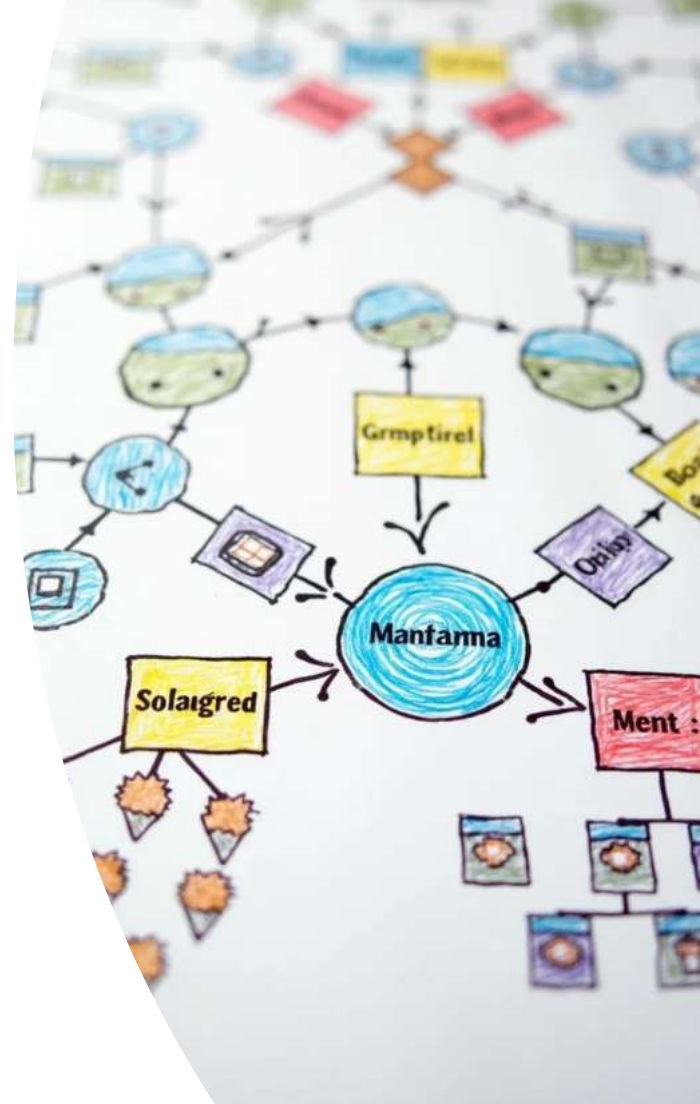Uses internal model of the world

Goal-Based Agent

Acts to achieve specific goals

Utility-Based Agent

Chooses actions based on best outcome

Learning Agent

Learns and improves performance over time

5. Types of Environment in AI

1	2	3	4	5
Fully Observable / Partially Observable	Deterministic / Stochastic	Episodic / Sequential	Static / Dynamic	Discrete / Continuous

Example:

Self-driving car operates in a partially observable, dynamic, and stochastic environment.

6. Uninformed Search (Blind Search)

Uninformed search algorithms do not have additional information about the goal.

Types

1 **BFS (Breadth First Search)**

Explores all nodes at the current depth before going deeper.

2 **DFS (Depth First Search)**

Explores as far as possible along a branch.

3 **DLS (Depth Limited Search)**

DFS with a depth limit.

4 **IDS (Iterative Deepening Search)**

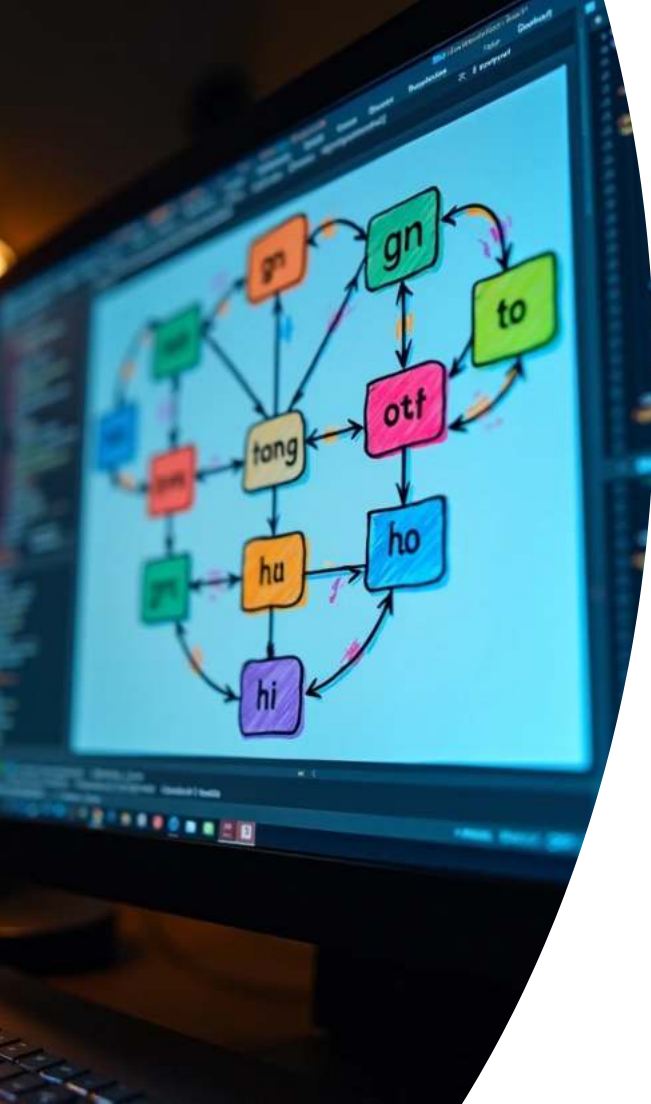Repeatedly applies DLS with increasing limit.

5 **Bidirectional Search**

Searches forward from start and backward from goal simultaneously.

7. Informed Search (Heuristic Search)

Informed search uses heuristics — extra knowledge about the problem.

Common Algorithms

1

Best First Search

Expands the node that appears best according to a heuristic.

2

Beam Search

Expands only the best k nodes at each level.

3

A* Algorithm

Uses\

where\

(g(n)): cost so far\

(h(n)): estimated cost to goal

8. 8-Puzzle Problem

Description

A 3x3 grid puzzle with tiles numbered 1–8 and one blank space.
Goal: Arrange the tiles in order using the blank space.

State Space

All possible tile arrangements.