

## **An example of Unacceptable Assignment**

### **The Reasons for Nonacceptance:**

1. There is no clue about who submitted the assignment.
2. The assignment is typeset, not solved by hand.
3. Page numbers are not numbered.
4. One of the figures is distorted or misplaced.

**Course Code:** OMC205

**Course Title:** Introduction to Artificial Intelligence

-----SECTION A-----

1. Putting your intelligence in Machine
2. Simple-action rule
3. Utility-based agent
4. False
5. IPL
6. An AI Programming Language.
7. An axiom
8. Only a set of rules
9. Minimax algorithm
10. Excellent time complexity

-----SECTION B-----

**1 .**

a> The criteria for classifying AI system based on level of human-like intelligence they exhibit their ability to perform specific task.

- a. Narrow Vs General AI
- b. Reactive Mechanism vs Limited Memory
- c. Symbolic AI vs SubSymbolic AI

b> AI system can be classified into several types based on their capabilities and functionalities:-

**a. Purely-Reactive :**

These machines do not have any memory or data to work with, specializing in just one field of work. For example, in a chess game, the machine observes the moves and makes the best possible decision to win.

**b. Limited Memory:**

These machines collect previous data and continue adding it to their memory. They have enough memory or experience to make proper decisions, but memory is minimal. For example, this machine can suggest a restaurant based on the location data that has been gathered.

**c. Theory Of Mind:**

This kind of AI system can understand , thought and emotions, belief and intentions and mental states to interact more effectively with humans. These systems attempts to recognize and respond to human and as well as interact socially in a more like human manner.

#### **d.Self Aware**

Self-aware machines are the future generation of these new technologies. They will be intelligent, sentient, and conscious , ans is a hypothetical type of AI that would possess consciousness and self awareness similar to human consciousness . this concept is more speculative and remains largely theoretical.

#### **e.Robotic AI system:**

Robotic AI integrates AI with physical machines, enabling robots to perform tasks autonomously or interact with the physical world. Examples include industrial robots, social robots and autonomous drones.

2. There are many industrial application of AI, here are 10 major applications:

##### 1. HealthCare:

The global market size of artificial intelligence in healthcare was valued at \$15.4 billion in 2022 and is predicted to expand at a CAGR of 37.5% between 2023 and 2030. One area of focus is cancer detection, where AI-powered systems analyze medical imaging data to identify patterns and anomalies indicative of cancer, leading to earlier detection and treatment.

##### 2. E-commerce:

There are vast AI uses in E-commerce industry, they can be used to analyze customer data, predict consumer behavior, and generate personalized product recommendations, enhancing customer experience and driving sales—companies like Amazon, Shopify, and Etsy already provide such features.

##### 3. Robotics

AI technology has played a crucial role in advancing the robotics industry, enabling robots to perform previously impossible or too risky tasks for humans. AI-powered robots are capable of autonomous navigation, allowing them to move quickly through complex environments, avoiding obstacles, and detecting potential collisions. Companies like Boston Dynamics are doing groundbreaking work in this space; take their dog robot, for example.

AI can also improve object recognition and grasping capabilities, making it easier for robots to manipulate objects with precision. Collaborative robots or “cobots” are becoming increasingly popular, working alongside human operators in factories to enhance productivity and efficiency.

##### 4. Finance

The applications of AI are being used to detect possibilities of fraud by analyzing large volumes of transactional data and identifying patterns of fraudulent behavior. This helps financial institutions prevent and mitigate fraud in real time.

Investment management is also revolutionized by AI, which analyzes market trends, identifies patterns, and predicts potential outcomes, enabling financial institutions to make informed investment decisions and optimize their portfolios.

## 5. Marketing

The applications of AI are also making an impression in the marketing industry. AI-generated content is being used to create fresh material, much faster and cheaper than a human resource. Programmatic media-buying powered by AI is utilized to optimize ad targeting and placement

## 6. Banking

AI is enhancing security, reducing operational costs, and improving customer service in the banking sector. Chatbots are one of the most commonly used applications of AI in banking. It delivers substantial cost savings by effectively tackling tasks such as balance inquiries, accessing mini statements, and fund transfers. Then there are the AI advisors that analyze a customer's financial health and history to provide investment recommendations.

## 7. Social Media

The use of AI in social media has become increasingly prevalent in recent years. This enables businesses to analyze user behavior and sentiment and make data-driven decisions to improve their social media strategy. Further, managing social media ads with AI allows businesses to optimize ad targeting and achieve better results. While these applications are already groundbreaking, one of the coolest new applications of AI in the social media sector has to be AI influencers.

## 8. Business

AI is fundamentally changing the way businesses operate. For instance, it can help companies to streamline their hiring process by automating tasks such as resume screening and candidate pre-screening. This can, in turn, lead to faster and more accurate candidate selection. For cybersecurity, AI-powered systems detect and prevent potential threats in real time.

## 9. Education

AI has provided an array of innovative applications to the education sector. With the help of AI, educational institutions can offer tailored learning experiences that match students' learning paces

and preferences. Moreover, task automation eliminates the need for manual and repetitive tasks, allowing educators more time to focus on value-adding activities.

#### 10.Sustainability

AI applications have significantly contributed to promoting sustainability in various industries. AI-infused clean, distributed energy grids can optimize energy use, reduce carbon emissions and improve grid stability. Additionally, AI-powered precision agriculture can help farmers reduce water consumption, optimize fertilizer use, and increase yields. AI can also improve supply chain sustainability by enabling transparency, traceability, and ethical sourcing of raw materials.

3.

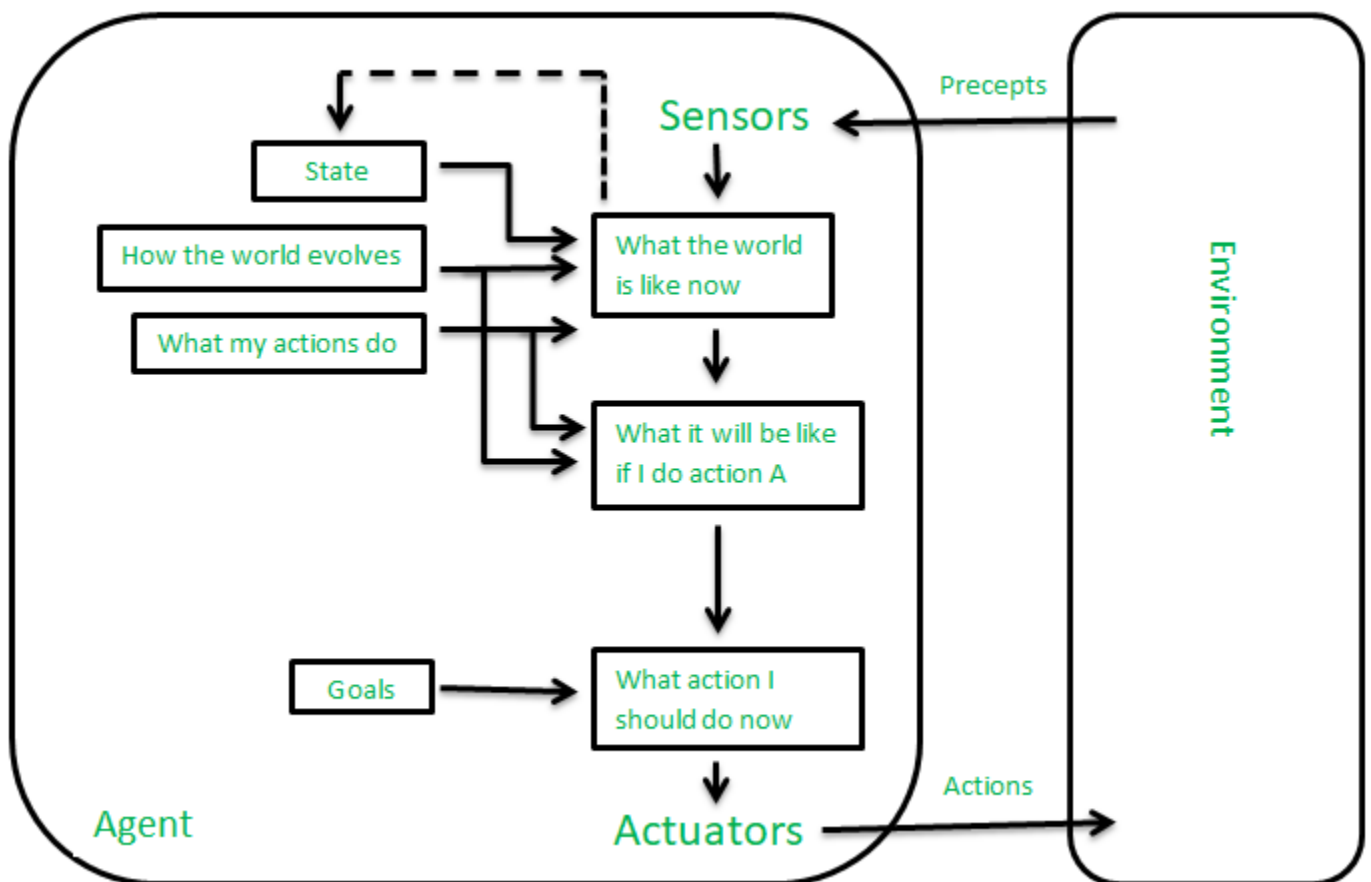


## Structure of an agent

Architecture is the machinery that the agent executes on. It is a device with sensors and actuators, for example, a robotic car, a camera, and a PC. An agent program is an implementation of an agent function. An agent function is a map from the percept sequence (history of all that an agent has perceived to date) to an action.

Agent = Architecture + Agent Program

4.



These kinds of agents take decisions based on how far they are currently from their goal (description of desirable situations). Their every action is intended to reduce their distance from the goal. This allows the agent a way to choose among multiple

possibilities, selecting the one which reaches a goal state. The knowledge that supports its decisions is represented explicitly and can be modified, which makes these agents more flexible. They usually require search and planning. The goal-based agent's behavior can easily be changed.

5.

a GPS in a car acts as a goal-based agent by processing user input (the desired destination) and utilizing its knowledge base (digital map and real-time data) to determine the best route to achieve the goal. It continuously assesses the car's position, updates its instructions, and adapts its decisions based on feedback and changing conditions, ultimately guiding the car towards the intended destination efficiently and effectively.

**Goal:** The primary goal of the GPS is to guide the car from the current location to a user-specified destination. The user inputs the destination into the GPS, which becomes the agent's objective.

**Knowledge Base:** The GPS has a built-in knowledge base that contains a digital map of roads, intersections, and geographic information. It knows the current location of the car through satellite signals and can determine the best routes to the destination based on this map.

**Perception:** The GPS perceives the car's current location and the desired destination provided by the user.

**Decision-Making:** To achieve its goal, the GPS employs a decision-making process that involves calculating the most efficient route from the current location to the destination. It considers factors like distance, estimated travel time, traffic conditions, road restrictions, and other real-time data.

**Action:** Once the GPS determines the best route, it communicates the directions to the driver through a user-friendly interface, such as voice prompts or visual maps. The driver follows these instructions to navigate the car towards the destination.

**Planning:** If the car deviates from the recommended route or encounters traffic delays, the GPS continuously adjusts its instructions and recalculates a new path to keep the driver on track towards the goal.



Feedback and Learning: Some GPS systems can incorporate feedback from drivers, such as reporting traffic incidents or suggesting alternative routes. This feedback helps the GPS improve its future decision-making and route planning, learning from its interactions.