Course: Artificial Intelligence and Machine Learning

Code: 20CS51I

WEEK1- Artificial intelligence concepts

Session2:

Meaning of AI

Artificial Intelligence is a method of making a computer, a computer-controlled robot, or a software think intelligently like the human mind. AI is accomplished by studying the patterns of the human brain and by analyzing the cognitive process. The outcome of these studies develops intelligent software and systems.

Working of AI

AI works by **combining large amounts of data with fast, iterative processing and intelligent algorithms, allowing the software to learn automatically from patterns or features in the data**.

This combination allows AI to learn from patterns and features in the analyzed data.

 Each time an Artificial Intelligence system performs a round of data processing, it tests and measures its performance and uses the results to develop additional   expertise.

A common AI application that we see today is the automatic switching of appliances at home. When you enter a dark room, the sensors in the room detect your presence and turn on the lights. This is an example of non-memory machines. Some of the more advanced AI programs are even able to predict your usage pattern and turn on appliances before you explicitly give instructions.

Some AI programs are able to identify your voice and perform an action accordingly. If you say, "turn on the TV", the sound sensors on the TV detect your voice and turn it on.

With the Google dongle and a Google Home Mini, you can actually do this every day.

Purpose of Artificial Intelligence

There are some main purposes and features in which artificial intelligence is used in different fields or zones. These are the main purposes of artificial intelligence.

1. Improves decision making
2. Singularity
3. Machine learning
4. Business process optimization
5. Creative work in technologies
6. Provides financial services
7. Health care
8. Automotive
9. HR & Recruitment

Types of Artificial Intelligence
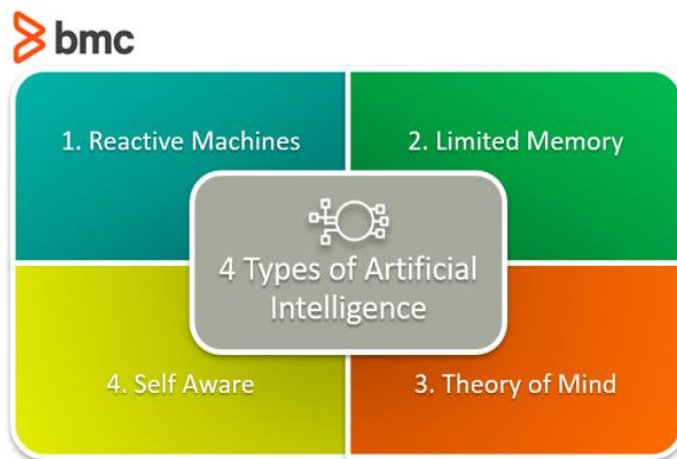
1. Purely Reactive

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.

2. 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.

3. Theory of Mind

This kind of AI can understand thoughts and emotions, as well as interact socially. However, a machine based on this type is yet to be built.

4. Self-Aware

Self-aware machines are the future generation of these <u>new technologies</u>. They will be intelligent, sentient, and conscious.

Goals of AI

1. Logical Reasoning

   AI programs enable computers to perform sophisticated tasks. On February 10, 1996, IBM's Deep Blue computer won a game of chess against a former world champion, Garry Kasparov.

2. Knowledge Representation
   <u>Smalltalk</u> is an object-oriented, dynamically typed, reflective programming language that was created to underpin the "new world" of computing exemplified by "human-computer symbiosis."

3. Planning and Navigation

   The process of enabling a computer to get from point A to point B. A prime example of this is <u>Google's self-driving Toyota Prius.</u>

4. Natural Language Processing

   Set up computers that can understand and process language.

5. Perception

    Use computers to interact with the world through sight, hearing, touch, and smell.

6. Emergent Intelligence

    Intelligence that is not explicitly programmed, but emerges from the rest of the specific AI features. The vision for this goal is to have machines exhibit emotional intelligence and moral reasoning.

Applications of AI
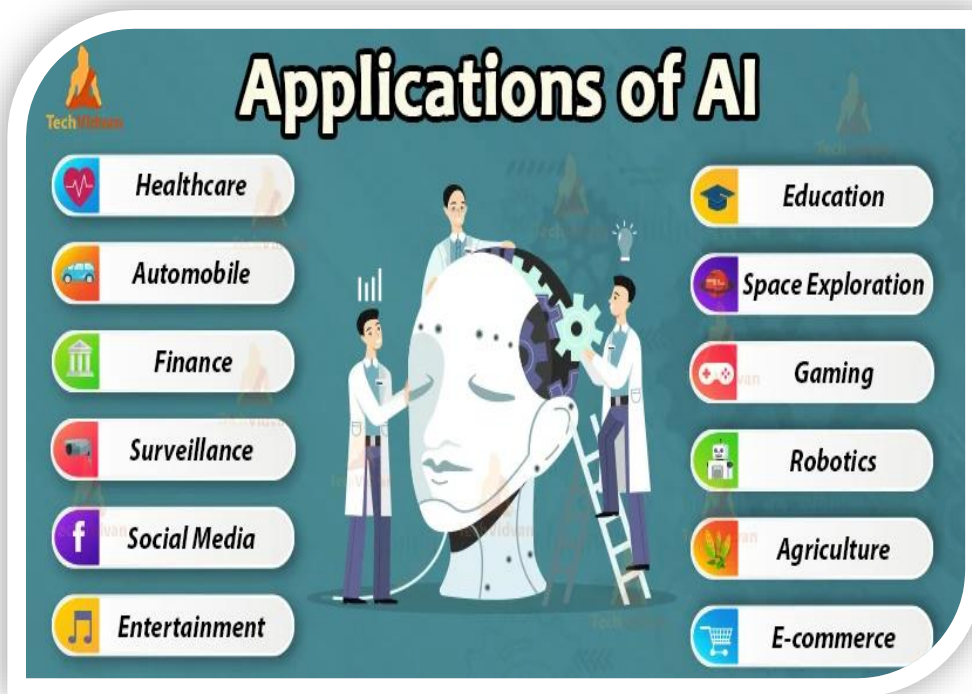
1. E-Commerce
   - Personalized Shopping
   - AI-powered Assistants
   - Fraud Prevention

2. Education
   - Administrative Tasks Automated to Aid Educators
   - Creating Smart Content
   - Voice Assistants
   - Personalized Learning

3. Lifestyle
   - Autonomous Vehicles
   - Spam Filters
   - Facial Recognition
   - Recommendation System
4. Navigation
5. Robotics

   - Carrying goods in hospitals, factories, and warehouses
   - Cleaning offices and large equipment
   - Inventory management
6. Human Resource
7. Healthcare
8. Agriculture
9. Gaming
10. Automobiles

11. Social Media

- Instagram

- Facebook

- Twitter

12. Marketing

13. Chatbots (<u>AI chatbots can comprehend natural language</u>)

14. Finance

Descriptive Questions:

Q1: Define AI and explain its working

Q2: Discuss purposes and features of AI

Q3: List and explain different types of AI

Q4: Discuss real life applications of AI

Multiple choice questions

1. What is the full form of "AI"?

a) Artificially Intelligent

b) Artificial Intelligence

c) Artificially Intelligence

d) Advanced Intelligence

Ans: b

2. What is Artificial Intelligence?

a) Artificial Intelligence is a field that aims to make humans more intelligent

b) Artificial Intelligence is a field that aims to improve the security

c) Artificial Intelligence is a field that aims to develop intelligent machines

d) Artificial Intelligence is a field that aims to mine the data

Ans: c

3. Which of the following is an application of Artificial Intelligence?

a) It helps to exploit vulnerabilities to secure the firm

b) Language understanding and problem-solving (Text analytics and NLP)

c) Easy to create a website

d) It helps to deploy applications on the cloud

Ans: b

4. In how many categories process of Artificial Intelligence is categorized?

a) categorized into 5 categories

b) processes are categorized based on the input provided

c) categorized into 4 categories

d) process is not categorized

Ans :c

5.Artificial Intelligence is about_____.

a)Playing a game on Computer

b)Making a machine Intelligent

c)Programming on Machine with your Own Intelligence

d)Putting your intelligence in Machine

Ans: b

6. Which of the following is not an application of artificial intelligence?

a) Face recognition system

b) Chatbots

c) LIDAR

d) DBMS

Ans: d