ARTIFICIAL INTELLIGENCE

THEORY ASSIGNMENT NO: 02

Q.1. Explain applications of artificial intelligence in business and agriculture.

→ * Applications of AI in Agricultural field:

1. Agricultural Robots:

- Agricultural Robots are used to handle essential agricultural tasks such as harvesting crops at a higher volume & faster pace than human laborers.
- Robots are designed to assist in picking & packing crops while combating other challenges within the agricultural labour force.
- Agricultural Robots can protect crops from harmful weeds that may be resistant to herbicide chemicals that are meant to eliminate them.

2. Drones:

- Drone technology helps users improve their crop yeild & reduce costs, users program the drone's route and once deployed the device will leverage computer vision to record images which will be used for analysis.
- AI & ariel technology can monitor crop health.
- It can use algorithms to integrate & analyze the captured images and data.

- Machine learning is used to provide an analysis of crop or soil health, Machine learning provides farmers and labourers.
- Drones that uses AI help farmers to scan their fields and monitor every stage of production cycle.

* Applications of AI in Business field:
  - Transferring and Cross-referencing data; updating files.
  - Consumer behaviour forecasting and product recommendations.
  - Fraud detection.
  - Personalised advertising and marketing messaging.
  - Customer service via telephone or chatbots.

Q.2. Explain applications of artificial Intelligence in natural language processing and robotics.

→ * Applications of AI in Robotics:

1. Assembly:
- AI is a highly useful tool in robotic assembly applications.
- When combined with advanced vision systems, AI can help with real-time course correction.
- AI can also be used to help a robot learn on its own which paths are best for certain processes.

2. Packaging:
- Robotic packaging uses forms of AI frequently for quicker lower cost and accurate packaging.
- AI helps save certain motions a robotic system makes, which makes installing and moving robotic systems easy enough for anybody to do.

* Applications of AI in Natural language processing:

1. Customer service:

- Robots are now being used in customer service capacity in retail stores and hotels around the world.
- Most of the AI robots leverage AI natural language processing abilities to interact with customers in a more human way.

2. Sentiment Analysis:

- Mostly used on the web & social media monitoring, Natural Language processing is a great tool to comprehend and analyze the responses to the business messages published on social media platforms
- It helps to analyze the attitude and emotional state of the writer. This application is also known as opinion mining.

3. Explain the different architectures of deep neutral networks. How artificial intelligence can be used in computer vision?

→ * Different architectures of deep neural networks are:

1. Recurrent Neural Networks:

- Recurrent Neural Networks are in the family of feed-forward neural networks.
- Recurrent Neural network allow for both parallel and sequential computation. It is a large feedback network of connected neurons that learns to translate a lifelong sensory input stream into a sequence of useful motor outputs.
- Recurrent neural network are a very natural way to model sequential data. They have the ability to remember information in their hidden state for a long time but is very hard to train them.

2. Recursive Neural Networks :

- Recursive N.N, like Recurrent N.N, can deal with variable length input.
- The primary difference is that Recurrent Neural Networks have the ability to model the hierarchical structures in training datasets.
- A Recursive Neural Network architecture is composed of a shared - weight matrix and a binary tree structure that allows the recursive network to learn varying sequences of words or parts of an image

3. Convolutional Neural Networks (CNN's) :

- The goal of a CNN is to learn higher - order features in the data via convolutionals. They are well suited to object recognition with images.
- They can identify faces, individuals, street signs and many other aspects of visual data. They are also good at analyzing sound.
- Following is the list of some popular architectures of CNN
  - LeNet
  - AlexNet
  - ZFNet
  - GoogLeNet
  - ResNet

- Computer vision is a field of artificial Intelligence that trains computers to interpret and understand the visual world.
- As computer vision evolved, programming algorithms were created to solve individual challenges.
- Computer vision, an AI technology that allows computers to understand and label images, can be used in:
  - convinience stores
  - driverless car testing
  - daily medical diagnostics
  - monitoring the health of crops and livestock.