Class- VIII

Chapter-4 Data Science and Artificial Intelligence

1. What is a podcast? Is it different from searching the web through a browser?

A podcast is a digital audio program that can be streamed or downloaded and listened to anytime. It is different from web searching because podcasts provide audio-based content on specific topics, while a browser search gives text, images, and videos from many websites.

2. What is an Application Programming Interface (API)?

An API (Application Programming Interface) is a set of function and procedure that allows two software applications to communicate with each other. It helps applications share data and services without knowing how the other system works internally. Most popular API for image analytics are:

Google Cloud Vision API – Image labeling, face detection, OCR, object detection

Microsoft Azure Computer Vision API – Image analysis, OCR, face recognition

IBM Watson Visual Recognition – Image classification and object detection

Amazon Rekognition – Object detection, facial analysis, image moderation

3. Is VR a use case of AI?

Virtual Reality (VR) is not directly a use case of AI, but it can use AI technologies . AI helps VR systems by improving graphics, object interaction, and user experience through intelligent responses.

Long Answer questions:

1. What is the use of data science in speech recognition?

Data science plays a very important role in speech recognition systems. It helps in collecting and analyzing large amounts of voice data from different speakers, languages, and accents. Using data science techniques, audio signals are cleaned, processed, and converted into numerical data. Machine learning models are trained on this data to recognize speech patterns and understand spoken words. Data science also helps improve accuracy by continuously learning from new data. Speech recognition is used in voice assistants, customer support systems, smart devices, and mobile applications. Without data science, it would not be possible for computers to understand human speech effectively.

2. Describe a use case for analysing images.

One important use case of image analysis is in healthcare, especially in medical diagnosis. Doctors use image analysis to study X-rays, MRI scans, and CT scans. Data science and AI help identify diseases like tumors, fractures, and infections by analyzing medical images. Image analysis is also used in security systems for face recognition, traffic management to detect vehicles, and agriculture to monitor crop health. By analyzing images, computers can detect patterns, identify objects, and support faster and more accurate decision-making.

3. What are some of the goals of Artificial Intelligence?

The main goals of Artificial Intelligence are to create systems that can think, learn, and make decisions like humans . AI aims to automate tasks, solve complex problems, and improve efficiency. Other goals include enabling machines to understand natural language, recognize images and speech, and adapt to new situations. AI also focuses on helping humans by providing intelligent recommendations, improving healthcare, education, and safety. Overall, AI aims to make machines intelligent enough to assist humans in daily life.

1. What is text data analytics?

Text data analytics is the process of analyzing large amounts of textual data to extract meaningful information and patterns. Text data includes emails, social media posts, reviews, articles, and documents. Since text is unstructured, it is first cleaned and processed using techniques such as tokenization, removing stop words, and stemming. Natural Language Processing (NLP) techniques are used to understand the meaning of words and sentences. Text data analytics helps in sentiment analysis, topic identification, spam detection, and customer feedback analysis**. For example**: companies analyze customer reviews to understand opinions about their products. Governments use text analytics to monitor public feedback.

2. How are natural languages processed?

Natural languages are processed using Natural Language Processing (NLP), which is a branch of Artificial Intelligence. The process begins with collecting text or speech data. The data is cleaned by removing unwanted symbols and errors. Then the text is broken into smaller parts such as words or sentences. Computers analyze grammar, meaning, and context using algorithms and machine learning models. NLP techniques help machines understand human language, translate languages, answer questions, and recognize speech. Examples include chatbots, voice assistants, and translation apps. NLP enables computers to communicate with humans in a natural and meaningful way, making technology more user-friendly and intelligent.