Deep Learning is a branch of artificial intelligence that uses multilayered neural networks to recognize patterns, make predictions, and learn from large amounts of data. A deep neural network is composed of many layers of interconnected nodes, where each layer extracts increasingly complex features from the input. Early layers typically identify simple patterns such as edges or colors, while deeper layers learn abstract concepts such as objects or categories. Deep Learning works by passing input data forward through the network, calculating a prediction, then adjusting the internal weights through backpropagation so the prediction becomes more accurate over time. This iterative process continues until the system performs well on the task.

Deep Learning is useful because it can learn features automatically, without requiring manual rule-creation. This makes it especially powerful for fields like computer vision, speech recognition, and natural language processing, where traditional programming approaches struggle. A common real-world example is image recognition, such as a convolutional neural network (CNN) identifying whether an image contains a cat, a car, or a face. CNNs automatically learn patterns like edges, textures, and shapes, allowing them to achieve human-level accuracy on many vision tasks. Deep Learning also powers applications such as self-driving cars, recommendation systems, fraud detection, medical image analysis, and personal voice assistants.

GitHub is an online platform used to store, manage, and track changes to software projects. It is built on top of Git, a version control system that records every update made to source code so developers can collaborate without overwriting one another's work. GitHub allows users to upload their repositories, share code publicly or privately, and keep a complete history of every modification. When developers work together, GitHub helps them clone repositories, create branches, submit pull requests, and merge new features safely into the main project.

GitHub is used whenever software development requires organization, collaboration, or version tracking. It is valuable because it prevents accidental code loss, allows multiple developers to work on the same project simultaneously, and keeps a permanent backup of all versions of a program. Companies prefer developers who use GitHub from the command line because it shows familiarity with real-world professional workflows. Some advantages of GitHub include cloud-based storage, powerful collaboration tools, issue tracking, and integration with DevOps pipelines. A disadvantage is that beginners may find Git's command-line workflow difficult at first. Another limitation is that private repositories may require paid features for organizations with many users. Despite this, GitHub remains the industry standard for software development.