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Bytewise Learning Track – ML/DL

Week1 Task

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| **Introduction to version control with Git and GitHub** |
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| **Git Branching Hands on Learning** |  |
| **Understanding key terminologies and differences between them (AI/ML/DL/Data Science)** |  |
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**GIT:**

It is a distributed version control system that was developed in 2005. It is designed to help developers manage changes to source code over time.

KEY CHARACTERISTICS:

-Distributed Architecture: Each developer has their own local repository, having the entire development history.

-Branching and Merging: Facilitates concurrent/parallel development streams and seamless integration of changes.

-Efficiency: Optimized for performance, handling small to very large projects with speed and efficiency.

-Data Integrity: Utilizes cryptographic methods to safeguard code history against unauthorized changes.

**GitHub:**

it is an internet hosting service for version control using Git. It simplifies collaboration among developers.

MAIN FEATURES:

Code Repository: Acts as a cloud storage for project code/material, providing version control capabilities of Git.

Collaborative Features: Offers tools like issues, pull requests, and actions for enhanced project collaboration.

Code Review Mechanisms: Provides an interface for peer review of code changes before they are merged into the main codebase.

**Artificial Intelligence (AI)**

- Artificial -> manmande

- intelligence-> decision taking ability

AI is about enabling machines to take his own decisions.

This field aims to replicate human cognitive functions with machines, particularly computers. It’s about creating systems which is capable of tasks that would typically require human intelligence.

HIGHLIGHTS:

Broad Application: It covers various technologies and methodologies.

Functionality:Its Capable of performing simple to complex tasks that usually need human-like cognitive processes.

Use Cases: Ranges from virtual assistants to complex decision-making systems in various industries.

**Machine Learning (ML)**

As a branch of AI, ML concentrates on algorithms that enable computers to learn from data and make informed predictions or decisions.

HIGHLIGHTS:

Adaptive Learning: The ability to learn and improve from experience without being explicitly programmed.

Variety of Techniques: Encompasses different learning styles such as supervised, unsupervised, and reinforcement learning.

Practical Applications: Used in areas like email filtering, facial recognition, and personalized recommendations.

**Deep Learning (DL)**

DL is a specialized area within ML that deals with neural networks that are ‘deep’ due to their multiple layers. These networks can learn from a large amount of unstructured data.

IMPORTANT ASPECTS:

Complex Structures: Comprises artificial neurons arranged in interconnected layers that simulate the neural pathways in the brain.

High Performance: Particularly effective for handling complex tasks like visual recognition and natural language processing.

Real-world Examples: Powers advanced technologies such as intelligent personal assistants and self-driving cars.

**DATA SCIENCE(DS)**

- simply changing raw data into valuable insights/results by using various techniques and tools.

OR

- interdisciplinary field that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from structured and unstructured data.

-> Structured data is organized in a fixed format, making it easily searchable, such as in databases or spreadsheets. Like name, date, etc.

-> Unstructured data, on the other hand, lacks a predefined format or structure. Like image, audio, video, etc.

FIELDS USED IN DS:

Statistics: used for analysis(calculations) of data, providing methods to collect, analyze, interpret, and present data.

Machine Learning: making algorithms that from patterns of data and make predictions on it.

Data Engineering: Focusing on the practical application of data collection and data processing.

Data Visualization: Presenting data in a graphical format to understand trends and patterns.

Deep Learning: focuses on algorithms inspired by the structure and function of the brain called artificial neural networks.