**Week-1 Task**

**1. Introduction to Version Control with Git and GitHub**

Version control is a fundamental aspect of software development, allowing developers to track changes, collaborate efficiently, and manage project versions. Git is a distributed version control system, while GitHub is a platform that hosts Git repositories, providing additional features for collaboration and project management.

**Installation and Setup of Git**

To begin with Git, I installed it using the instructions provided. Verification was done through the command git version, which confirmed successful installation. Connecting Git to GitHub involved setting up a global username and email using the following commands:

git config --global user.name "Your Name"

git config --global user.email "your.email@example.com"

These configurations ensure that all commits are associated with the correct user details. I also created a GitHub account, which serves as an online repository hosting service where I can push my local Git repositories.

**Basic Git Commands**

* ***git commit -m "message"*:** Records changes to the repository with a descriptive message.
* ***git branch branch\_name and git checkout branch\_name*:** Manage and switch between branches.
* ***git merge branch\_name*:** Combines changes from different branches.
* ***git rebase branch\_name*:** Reapplies commits on top of another base branch, maintaining a clean project history.

**Git Branching Hands-on Learning**

Branching is a powerful feature in Git that allows developers to work on different features or fixes independently. I used the interactive tutorial on [Learn Git Branching](https://learngitbranching.js.org/) to understand and practice branching concepts.

**Key Learnings from the Tutorial**

* **Creating and switching branches**: This enables parallel development and isolation of different features.
* **Merging branches:** Combining changes from different branches to integrate new features or fixes.
* **Rebasing:** A technique to maintain a linear project history by moving commits from one branch to another.

The hands-on exercises and quizzes at the end of each section reinforced my understanding of these concepts, allowing me to apply them in practical scenarios.

**2. Understanding Key Terminologies and Differences**

**Artificial Intelligence (AI)**

AI refers to the simulation of human intelligence in machines. It encompasses a wide range of technologies and applications, from speech recognition to autonomous vehicles. The goal of AI is to perform tasks that typically require human intelligence, such as reasoning, learning, and problem-solving.

**Machine Learning (ML)**

ML is a subset of AI that focuses on algorithms and statistical models enabling machines to improve their performance on a task through experience. It deals primarily with structured data and includes various techniques such as decision trees, clustering, and neural networks.

**Deep Learning (DL)**

DL is a more specialized subset of ML that uses neural networks with many layers (hence "deep"). It excels at handling unstructured data such as images, audio, and text. DL models can automatically learn hierarchical representations of data, making them particularly powerful for tasks like image recognition and natural language processing.

**Data Science (DS)**

Data Science is an interdisciplinary field that combines domain expertise, programming skills, and knowledge of statistics and mathematics to extract meaningful insights from data. It involves data collection, cleaning, exploration, and visualization, often using tools like Python, R, and various statistical software.

**Resources Used:**

1. [Towards Data Science Article](https://towardsdatascience.com/data-science-vs-artificial-intelligence-vs-machine-learning-vs-deep-learning-9fadd8bda583)
2. [YouTube Video Guide](https://youtu.be/k2P_pHQDlp0?si=WwP90MxRVEjSPp8U)

**Summary**

AI, ML, DL, and DS are interrelated fields that collectively contribute to the advancement of intelligent systems and data-driven decision-making. Each field has its unique focus and methodologies, but they often overlap and complement each other in practical applications.

**Conclusion**

This week’s tasks provided a comprehensive introduction to Git and GitHub, hands-on experience with Git branching, and a deeper understanding of AI, ML, DL, and Data Science. These foundational skills and knowledge are crucial for anyone pursuing a career in ML / DL fields.