Bytewise Fellowship

(Assignment 01)

Version Control and Difference b/w AI/ML/DL

bytewise.

Batch 03

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1 Introduction to Version Control with Git and GitHub

Version control systems (VCS) like Git help manage changes to source code over time, enabling collaboration among multiple developers. GitHub is a web-based platform that uses Git for version control and provides a space to host and manage repositories.

1.1 Key Concepts

- **Repository (Repo):** A storage space for a project, containing all project files and their revision history.
- **Commit:** A record of changes made to the repository, akin to a "save point".
- **Branch:** A parallel version of the main project, allowing the development of features in isolation.
- **Merge:** Combining changes from different branches into one.
- **Pull Request:** A request to merge changes from one branch into another, usually involving code review.

1.2 Basic Git Commands

- **git init:** Initialize a new Git repository.

```
git init [repository name]
```

- **git clone [url]:** Clone a repository from a URL.

```
git clone [url]
```

- **git add [file]:** Add a file to the staging area.

```
git add [file]
git add *
```

- **git commit** -m "message": Commit changes with a message.

```
git commit -m "Type in the commit message"
```

- **git push:** Push changes to the remote repository.

```
git push [variable name] master
```

- **git pull:** Fetch and merge changes from the remote repository.

```
git pull [Repository Link]
```

2 Git Branching

Branching is a powerful feature in Git that allows developers to diverge from the main codebase and work on different versions simultaneously. This is particularly useful for adding new features or fixing bugs without disrupting the main codebase.

2.1 Key Concepts:

- **Branch Creation:**

```
git branch [branch-name]
```

- **Switching Branches:**

```
git checkout [branch-name]
```

- **Merging Branches:**

```
git merge [branch-name]
```

- **Branch Deletion:**

```
git branch -d [branch-name]
```

- **git push:** Push changes to the remote repository.

```
git push [variable name] master
```

- **git pull:** Fetch and merge changes from the remote repository.

```
git pull [Repository Link]
```

3 Differences: AI, ML, DL, Data Science

3.1 Artificial Intelligence (AI)

Artificial Intelligence is the broadest concept and refers to the simulation of human intelligence by machines. AI aims to create systems that can perform tasks that would typically require human intelligence, such as visual perception, speech recognition, decision-making, and language

translation. AI can be divided into two types: narrow AI, which is designed to handle a specific task (like voice assistants), and general AI, which can perform any intellectual task that a human can do.

3.2 Machine Learning (ML)

Machine Learning is a subset of AI that focuses on developing algorithms that allow computers to learn from and make decisions based on data. Rather than being explicitly programmed to perform a task, ML models identify patterns and make predictions or decisions based on input data. There are various types of ML, including supervised learning (learning from labeled data), unsupervised learning (finding hidden patterns in unlabeled data), and reinforcement learning (learning through trial and error).

3.3 Deep Learning (DL)

Deep Learning is a specialized subset of Machine Learning that uses neural networks with many layers (hence "deep") to analyze and interpret large amounts of data. These deep neural networks mimic the structure and function of the human brain's neural networks. DL has been particularly successful in areas such as image and speech recognition, natural language processing, and autonomous driving. The key advantage of DL is its ability to automatically feature extraction from raw data, eliminating the need for manual feature engineering.

3.4 Data Science

Data Science is an interdisciplinary field that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from structured and unstructured data. It encompasses a range of techniques from statistics, machine learning, and data mining to analyze and interpret complex data sets. Data scientists use these techniques to make data-driven decisions and predictions. Unlike AI, ML, and DL, which focus more on creating models and algorithms, Data Science focuses on the entire data processing pipeline, including data collection, cleaning, analysis, visualization, and interpretation.