**1. What is Machine Learning?***Explain what Machine Learning is in simple terms. How does it differ from traditional programming?*

*Unlike programming language that instruction should be encoded precisely, machine learning doesn’t need to be programmed explicitly, machine can learn by identifying patterns and make prediction base on inputted data.* **2. Why is Machine Learning important today?**

*Machine learning is very necessary because of its ability to predict certain outcome by using a dataset, it could be used in various industries like scientific research, data analysis, fraud detection, LLM training, and much more.*  **3. Compare the 3 Types of Machine Learning:***In your own words, describe and compare the 3 main types of Machine Learning:*

* **Supervised Learning**

*For me, Supervise learning is a type of machine learning that requires a dataset that has label to analyses. labeled data refers to datasets where each data is paired with a correct output or label, such as images tagged with the objects they contain.*

*Example: Images tagged as "cat" or "dog."*

* **Unsupervised Learning**

*Unsupervised learning is a type of machine learning that doesn’t require information about the data like series of numbers without field name or information about it, it usually designed to predict certain outcome like how series of information relate to each other. Unlabeled data consists of examples without any associated labels or answers. It is commonly used in unsupervised learning, where the goal is to find patterns, groupings, or structures within the data without predefined categories.*

*Example: Customer reviews without sentiment tags, grouped by similarity.*

* **Reinforcement Learning**

Reinforcement learning is a type of machine learning where a machine learns by interacting with its environment and receiving feedback in the form of rewards or penalties. Like for instance, a robot can learn how much torque to apply to its gears to climb a slope within a specific time frame. Through repeated trials and response, the robot improves its decision-making over time by reinforcing successful behaviors and adjusting unsuccessful ones.

Example: Maze-solving robot car.

**Which one you find most interesting, and why?**

*For me, unlabeled data is the most interesting because it challenges us to discover hidden patterns and insights without any explicit guidance. Unlike labeled data, which provides clear resuult, unlabeled data requires creativity and advanced techniques to extract meaningful information.*

**4. Real-World Applications of Machine Learning**  
*Give****two (2)****examples of where Machine Learning is used in daily life, apps, systems, or services.*

1. The machine learning can be used by LTO to detect speeding cars or unregistered cars by scanning plate numbers using a surveillance camera.
2. Machine learning can be used to check student attendance by using capturing faces of student passing thru the hallway.