**Question 1 : What is Machine Learning?**

Machine Learning (ML) is a subfield of Artificial Intelligence (AI) that focuses on enabling computers to learn from data without being explicitly programmed. Instead of relying3on rule-based programming, ML algorithms identify patterns in data, learn from these patterns, and then make predictions or decisions based on new, unseen data.

**Question 2 : What is Supervised Machine Learning Algorithm?**

Supervised learning is a type of machine learning where the algorithm learns from labeled data. Labeled data consists of input features along with their corresponding correct output labels. The goal of a supervised learning algorithm is to learn a mapping function that can predict the output label for new, unseen input data.

1. **Training Data:** The algorithm is provided with a dataset where each data point has input features and a known output label.
2. **Learning:** The algorithm analyzes the training data to find relationships and patterns between the input features and the output labels. It builds a model that tries to map the inputs to the outputs.
3. **Prediction:** Once the model is trained, it can be used to predict the output label for new data points that it has never seen before, based on the patterns it learned from the training data.

Common types of supervised learning tasks:

* **Classification:** Predicting a categorical output label (e.g., spam or not spam, cat or dog).
* **Regression:** Predicting a continuous numerical output value (e.g., house price, stock price).

**Question 3 : What is Regression and Classification:**

Both regression and classification are types of supervised machine learning tasks, but they differ in the type of output they predict:

**Regression:**

* **Goal:** To predict a continuous numerical value.
* **Output:** A real number within a certain range.
* **Examples:**
  + Predicting the price of a house based on its size, location, and features.
  + Forecasting stock prices based on historical data and market trends.
  + Estimating the temperature for the next day.

**Classification:**

* **Goal:** To predict which category or class a data point belongs to.
* **Output:** A discrete label from a predefined set of categories.
* **Examples:**
  + Identifying whether an email is spam or not spam.
  + Classifying images of animals as cats, dogs, or birds.
  + Predicting whether a customer will churn (yes/no).