Project: Crop and fertilizer recommendation System

Week 1 assessment

1. What is Machine Learning (ML)?

Machine learning is a way of making computers learn from data, like how we learn from experience. Instead of writing step-by-step rules for everything, we give the computer a lot of examples, and it figures out patterns on its own. For example, if we want a program to recognize whether an image contains a cat or not, we don’t tell it exactly what a cat looks like. Instead, we give it thousands of pictures labeled “cat” or “not cat,” and therefore, the program learns to identify cats by itself. It’s used in many places—like recommending movies on Netflix, detecting spam emails, or driving self-driving cars etc.

1. What is a supervised learning algorithm?

Supervised learning is one of the most common types of machine learning. The idea is simple: you train the machine using a dataset that already has the answers (we call these “labels”). Similar to a student learning from a textbook with the solutions provided. The algorithm sees the inputs (like size of a house, number of rooms) and the corresponding outputs (like the price of the house), and it learns to connect the two. Later, when it’s given a new input without the answer, it tries to predict what the output should be based on what it learned. This kind of learning is used in tasks like predicting prices, diagnosing diseases, or classifying images.

1. What is regression?

Regression is a type of supervised learning, and it’s all about predicting numbers. So whenever the thing you’re trying to predict is a continuous value (like height, weight, or temperature), you’d use regression. For example, if you’re trying to predict someone’s salary based on their years of experience, education level, and location, that’s a regression problem. The goal is to find the best relationship between the inputs and the numeric output, like drawing a line that fits the data points as closely as possible.

1. What is classification?

Classification is another type of supervised learning, but unlike regression, here you’re predicting categories or labels instead of numbers. It’s like sorting things into different buckets. For instance, if you’re building a model to decide whether an email is spam or not spam, that’s a classification problem because the answer is either one category or the other. Classification can also involve more than two categories—like recognizing if a picture is of a cat, a dog, or a bird. It’s used in things like medical diagnosis (sick or healthy), customer feedback analysis (positive, neutral, or negative), and handwriting recognition.