**Relationship Between Artificial Intelligence and Machine Learning : -**

Ai refers to the broad capabilities of machines to perform activities using human like intelligence.

ML is a type of AI , it allows comps to automatically learn from experience without being explicitly programmed to do so. Using ML computers can learn from data to discover patterns and make predictions.

**There are 3 kinds of ML:-**

1. **Supervised Learning :-** Every training sample from the dataset has a corresponding label or output value associated with it. As a result , the Algo learns to predict labels or output values. Ex – predict a sale price of a house or classify objects in an image.
2. **Unsupervised Learning :** There are no labels for the training data. A ML Algo tries to learn underlying patterns or distributions that govern the data.

**In Supervised and unsupervised Learning the ML model inspects the data and tries to discover patterns, then the programmer or the user use the discovered patterns by the ML model to gain new understandings or predict.**

1. **Reinforcement Learning :-** It is a type of learning which takes a different approach. It learns through consequences of actions in an environment i.e it finds out what actions to take in certain situations to maximize the reward (somewhat like the Greedy approach of Algorithms).

**How Machine Learning differs from traditional programming based approaches –**

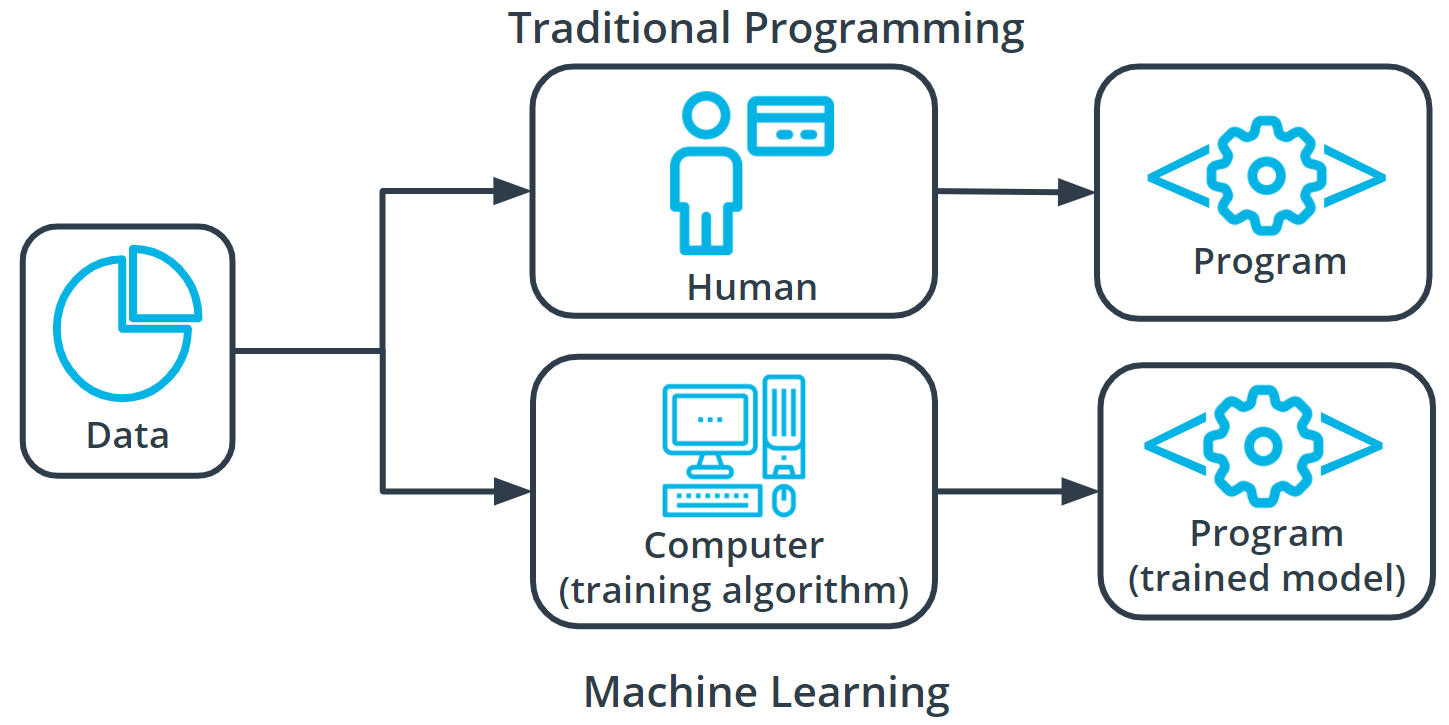
In traditional problem-solving with software, a person analyses a problem and engineers a solution in code to solve that problem. For many real-world problems, this process can be laborious (or even impossible) because a correct solution would need to consider a vast number of edge cases.

Imagine, for example, the challenging task of writing a program that can detect if a cat is present in an image. Solving this in the traditional way would require careful attention to details like varying lighting conditions, different types of cats, and various poses a cat might be in.

In machine learning, the problem solver abstracts away part of their solution as a flexible component called a model, and uses a special program called a model training algorithm to adjust that model to real-world data. The result is a trained model which can be used to predict outcomes that are not part of the data set used to train it.

In a way, machine learning automates some of the statistical reasoning and pattern-matching the problem solver would traditionally do.

The overall goal is to use a model created by a model training algorithm to generate predictions or find patterns in data that can be used to solve a problem.



Ex – If we train our pet dog to do certain things and reward him every time he does that correctly he will always do that because he knows that doing that stuff will reward him that’s how reinforcement learning works. It always find the best solution possible which will give maximum reward to the user.