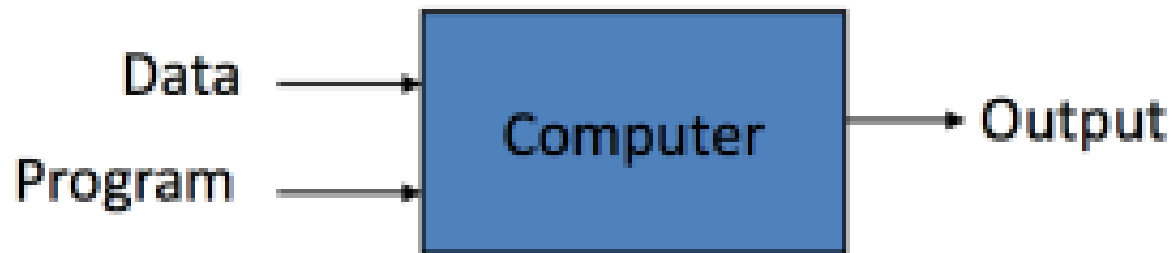


Types of Machine Learning

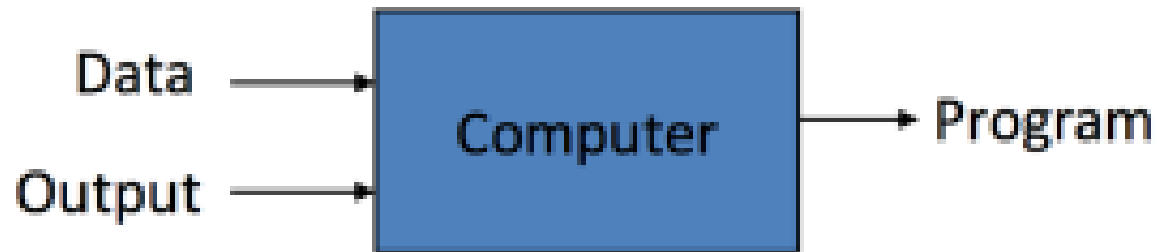
What is Machine Learning?

- The term **Machine Learning** was coined by **Arthur Samuel** in 1959, an American pioneer in the field of computer gaming and artificial intelligence and stated that
“It gives computers the ability to learn without being explicitly programmed”.

Traditional Programming



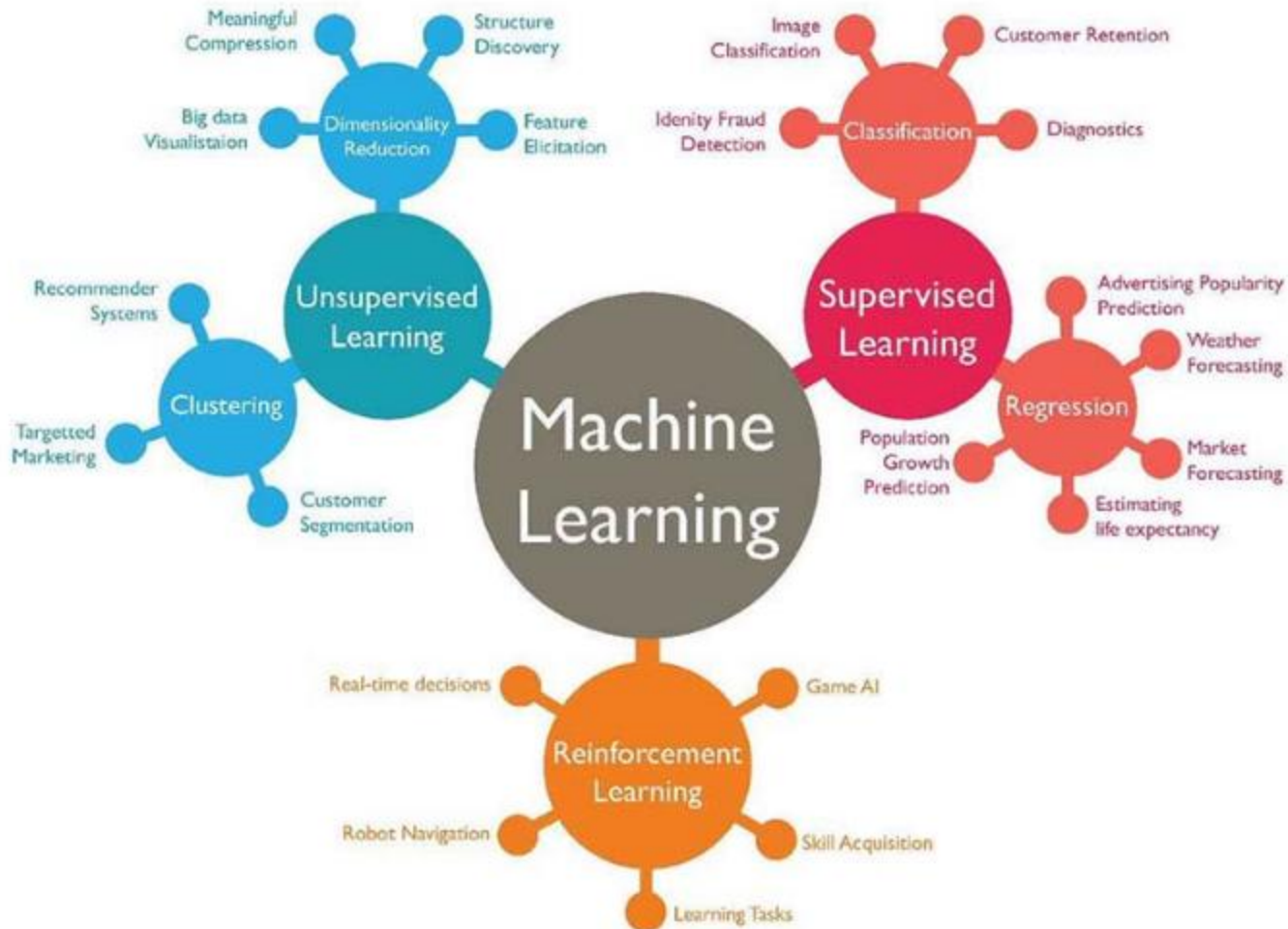
Machine Learning



What is Machine Learning?

- in 1997, **Tom Mitchell** gave a “well-posed” mathematical and relational definition that
“A computer program is said to learn from experience E with respect to some task T and some performance measure P , if its performance on T , as measured by P , improves with experience E .”

Types of Machine Learning



Types of Machine Learning

1. Supervised Learning :-

In supervised learning, we are given a data set and **already know what our correct output** should look like, having the idea that there is a relationship between the input and output.

Two types of Supervised Learning :-

Regression — Estimate continuous values (Real valued output)

Classification — Identify a unique class (Discrete values, Boolean or Categories)

Types of Machine Learning

1.1 Regression :-

Regression models a target prediction value based on independent variables. It is mostly used for finding out the **relationship between variables** and **forecasting**. Regression can be used to estimate/ predict **continuous values** (Real valued output).

For example : Given a picture of a person, we have to predict the age on the basis of the given picture .

Types of Machine Learning

1.2 Classification :-

Classification means to **group** the output into a class. If the data set is **discrete** or **categorical** then it is a classification problem.

For example : Given data about the sizes of houses in the real estate market, making our output about whether the house “sells for **more** or **less** than the asking price” i.e. Classifying houses into two discrete categories.

Types of Machine Learning



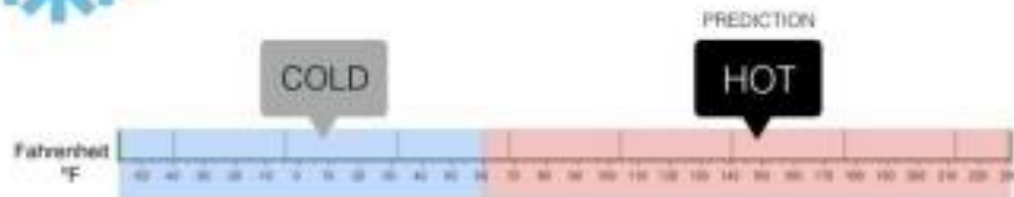
Regression

What is the temperature going to be tomorrow?



Classification

Will it be Cold or Hot tomorrow?



Types of Machine Learning

2. Unsupervised Learning :-

It allows us to approach problems with little or no idea about what our results look like. We can **derive structure** from data where we don't necessarily know the effect of the variables.

We can derive this structure by **clustering** the data based on relationships among the variables in the data.

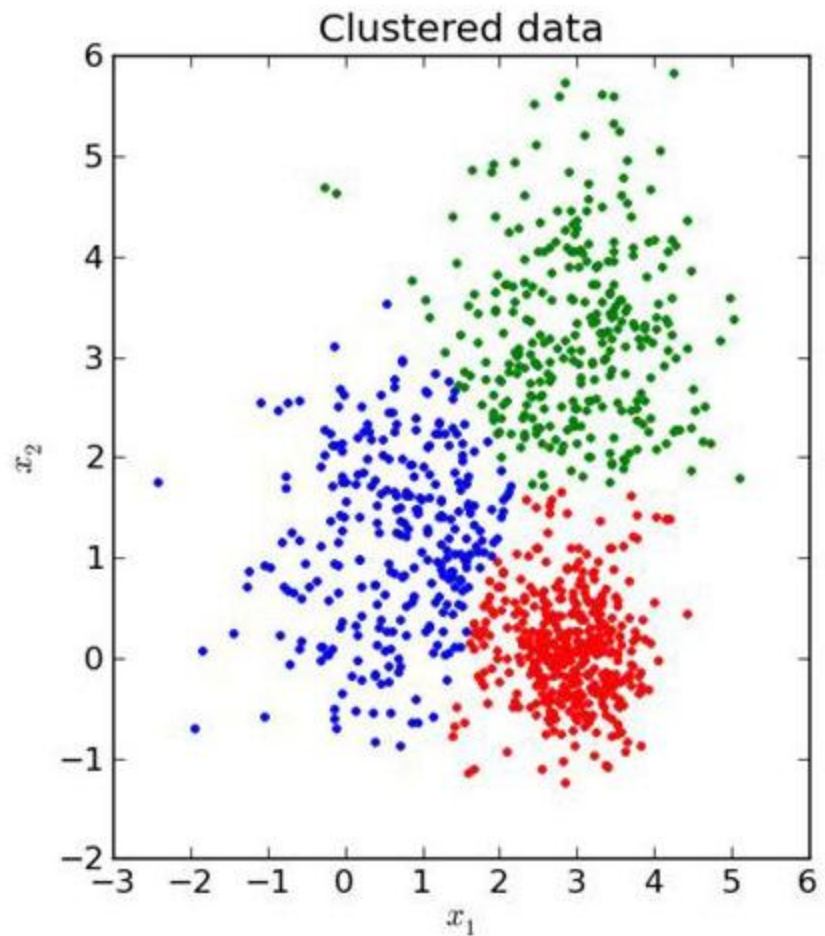
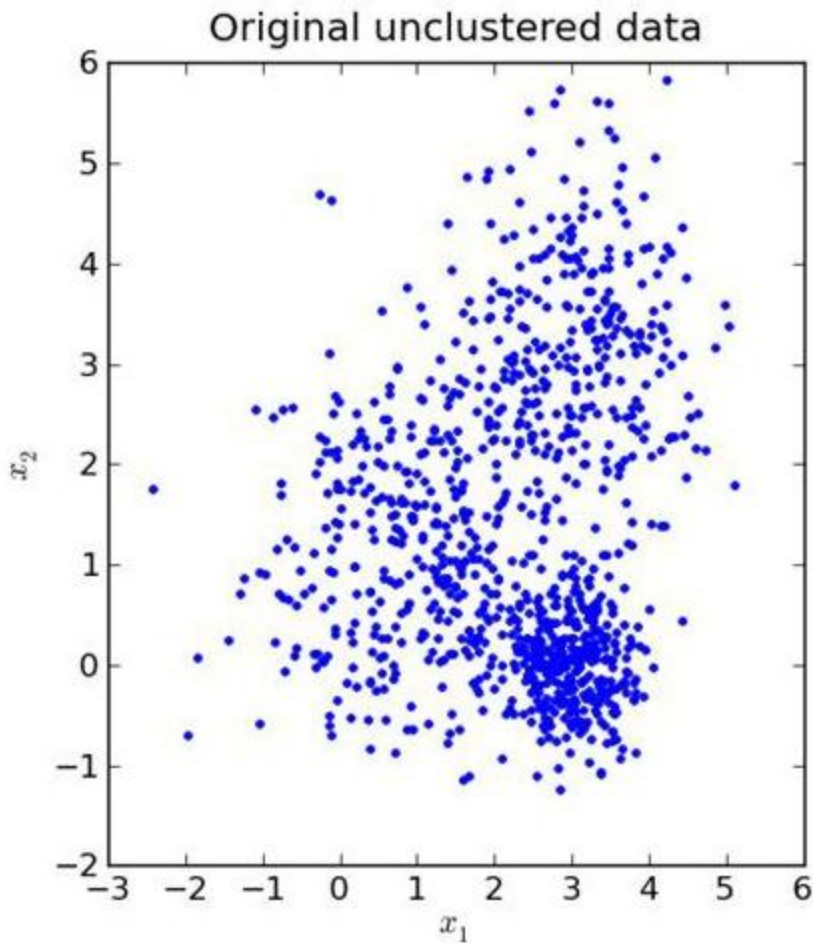
Types of Machine Learning

2.1. Clustering :-

Clustering is the task of grouping a set of objects in such a way that objects in the same group (called a **cluster**) are more similar (in some sense) to each other than to those in other groups (clusters).

For example : Take a collection of 1,000,000 different genes, and find a way to automatically group these genes into **groups that are somehow similar** or related by different variables, such as lifespan, location, roles, and so on.

Unsupervised Learning



Types of Machine Learning

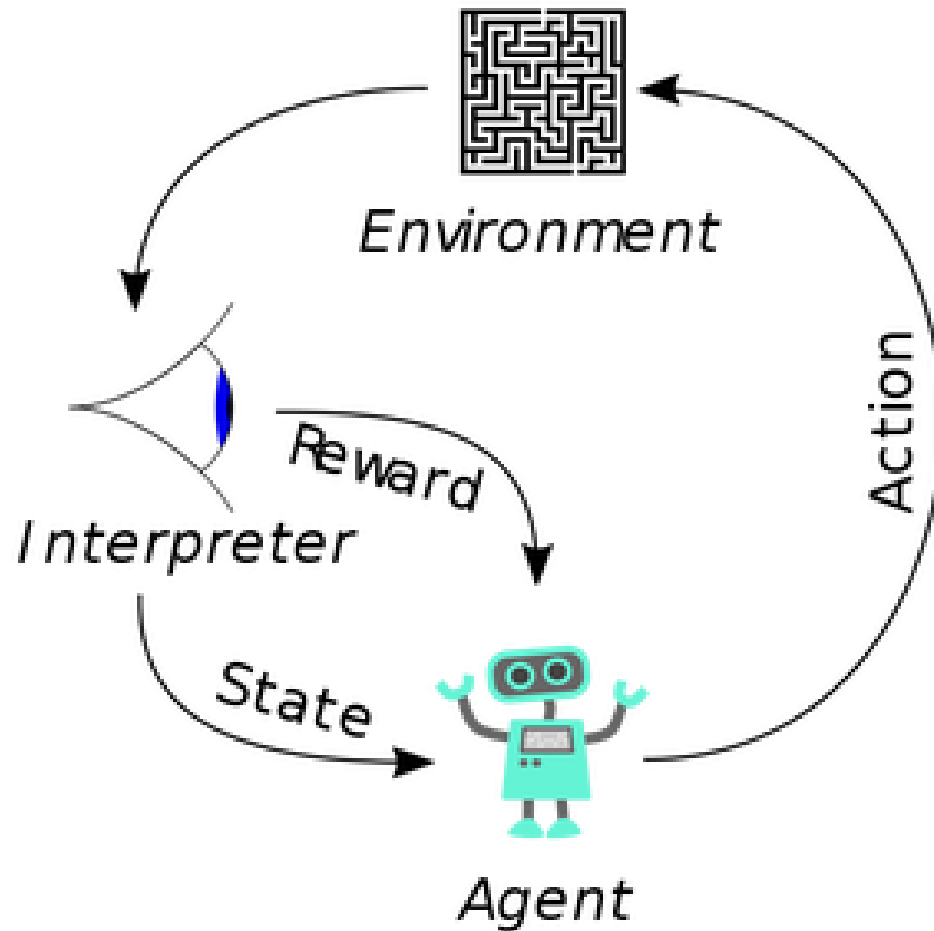
3. Reinforcement Learning :-

Reinforcement Learning is about taking suitable actions to **maximize reward** in a particular situation. It is employed by various software and machines to find the **best possible behavior** or path to take in a specific situation.

Types of Machine Learning

Reinforcement learning differs from the supervised learning in a way that in supervised learning the training data has the answer key with it, so the model is trained with the correct answer itself whereas in reinforcement learning, **there is no answer** and the **reinforcement agent** decides what to do in order to perform the given task. In the absence of training data set, it is bound to **learn from its experience**.

Types of Machine Learning



Types of Machine Learning

Applications of Machine Learning :-

- Virtual Personal Assistants.
- Predictions while commuting.
- Videos Surveillance.
- Social Media Services.
- Email Spam and Malware Filtering.
- Online Customer Support.
- Search Engine Result Refining.
- Product Recommendations.
- Online Fraud Detection.