AI vs ML vs DL vs DS

* AI-> ultimate goal: enables machine to think(without human intervention, can take its own decisions)

E.g. Self-driving car

* ML-> subset of AI(provides us statistical tools to explore and analyze the data and turn it into actionable insights)

Types:

1. Supervised learning (past labelled data)

Suppose we have an image of different types of fruits. The task of our supervised learning model is to identify the fruits and classify them accordingly. So to identify the image in supervised learning, we will give the input data as well as output for that, which means we will train the model by the shape, size, color, and taste of each fruit. Once the training is completed, we will test the model by giving the new set of fruit. The model will identify the fruit and predict the output using a suitable algorithm.

2. Unsupervised learning (unlabeled data) -> clustering

We will use the example given above. So unlike supervised learning, here we will not provide any supervision to the model. We will just provide the input dataset to the model and allow the model to find the patterns from the data. With the help of a suitable algorithm, the model will train itself and divide the fruits into different groups according to the most similar features between them.

3. Reinforcement learning -> Reward and punishment based->the machine learns based on the feedback given

Imagine a baby is given a TV remote control at your home (environment). In simple terms, the baby (agent) will first observe and construct his/her own representation of the environment (state).Then the curious baby will take certain actions like hitting the remote control (action) and observe how would the TV response (next state).As a non-responding TV is dull, the baby dislike it (receiving a negative reward) and will take less actions that will lead to such a result (updating the policy) and vice versa. The baby will repeat the process until he/she finds a policy (what to do under different circumstances) that he/she is happy with (maximizing the total (discounted) rewards).

* DL-> Deep Learning(subset of ML)->simulates the working of brain in the learning process(mimic human brain)

Multi Neutral network architecture

ANN (Artificial), CNN (Convolution),RNN (Recurring)

* DS (Data Science) -> It is an interdisciplinary field that unifies statistics, data analysis, ML and their related methods in order to understand and analyze actual phenomena with data. It employs techniques and theories drawn from many fields within the context of mathematics, statistics, information science and computer science

