

REINFORCEMENT LEARNING.

Reinforcement learning is a branch of machine learning that trains a model to come to an optimal solution for a problem by taking decisions by itself.

RL algorithms use a reward and punishment paradigm as they process the data. They learn from the feedback of each action and self discover the best processing paths to achieve final outcomes.

Benefits :-

1) RL algorithms can be used in complex environments with many rules and dependencies. In the same environment a human may not be capable of determining the best path.

2) It requires less human interaction

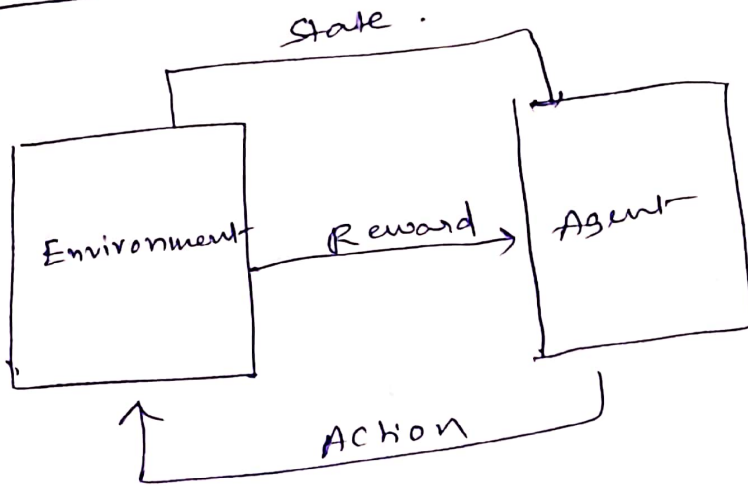
3) An RL Algorithm mimics the human reinforcement learning. It learns properly it receives a positive reward else it receives a negative reward.

- The agent is the ML algorithm.
- The environment is the problem space with attributes such as rules, valid actions.

The action is a step that RL agent takes to navigate the environment.

The state is the environment at a given point.

The reward is '+ve', '-ve' & '0'.



Types of RL Algorithms:-

Model based RL :-

used when environments are well defined and ~~unchanging~~. Unchanging.

Ex:- Consider a robot learning to navigate a new building to reach a specific room.

Model free RL

It is best use when ~~the~~ the environment is large, complex and not easily derivable.

Example :- Self driving Car.

Reinforcement learning vs Supervised learning (3)

In Supervised learning you define both input and expected associated o/p. Supervised learning ~~also~~ algorithms learns patterns and relations between i/p and o/p.

In RL instead of trying to map inputs with known o/p's. It maps inputs with possible outcomes

Challenges:-

- 1) Practicality :- Experimenting real world reward and punishment systems may not be practical.
- 2) Interpretability :- The reason why a particular sequence of steps taken may be difficult to ascertain.