Reinforcement Learning

- Reinforcement learning is learning what to do - how to map situations to actions - so as to maximize a numerical reward signal
- The learner is not told which actions to take
- Trial-and-error search and delayed reward
- One off the challenges is the trade-off between exploration and explotation.
- The agent has to exploit what it already experienced, but it also has to explore for better actions
- Elements of Reinforcement learning:
  - Policy: defines the learning agent's way of behaving at a given time. A policy is a mapping from perceived states of the environment to actions to be taken when in those states.
  - Reward signal: defines the goals of a RL problem. The reward signal thus defines what are good and bad events for the agent. This is the primary basis for altering the policy.

→ In immediate sense

- Value function: Specifies what is good in the long run. Roughly speaking, the value of a state is the total amount of reward an agent can expect to accumulate over the future, starting from that state.