Baby's First Reinforcement Learning

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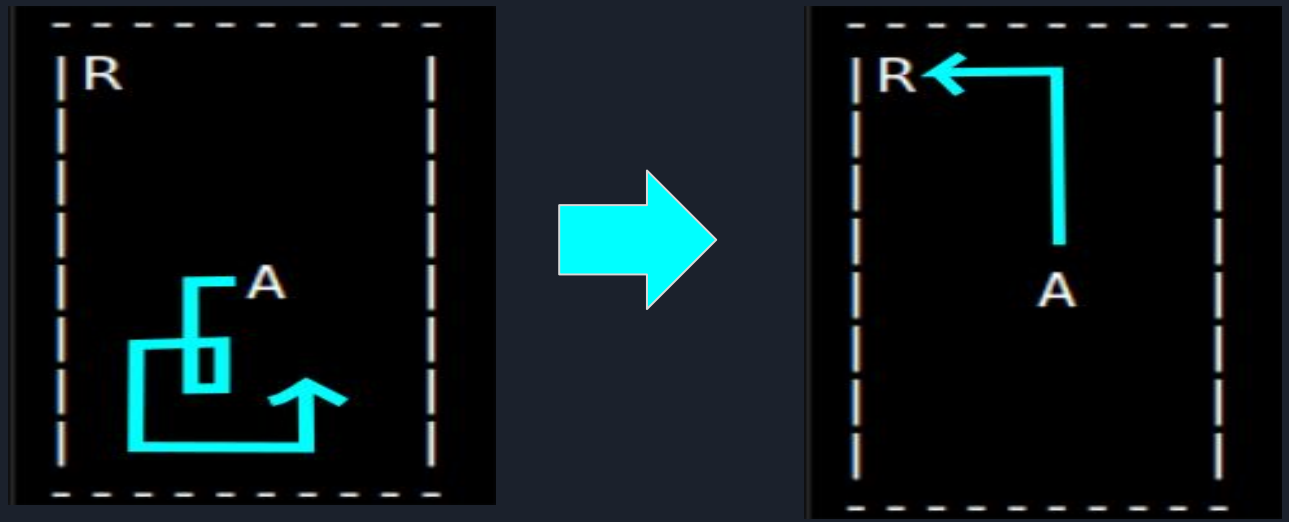
Reinforcement Learning

Reinforcement Learning is the area of Machine Learning concerned with training a software agent to maximize some notion of reward by observing the states of an environment and taking actions within it.

Objective - Teach an agent to collect a reward!



Plan of Work

- Develop basic “game” environment that can be used to train the agent (screenshots previous slide)
- Develop an algorithm for training a Markov Decision Process. Trained MDP then can control the agent to navigate the environment and collect rewards.
- Extend the algorithm to use a Neural Network for learning the state -> action policy, since discrete MDP’s have limitations.

Deliverables

- Jupyter notebook explaining the functionality and demonstrating the use of these algorithms.
- Additional Python 3 files that are used by the notebook.
- Final report discussing in detail my methodology and results.

Done So Far

- Implemented environment in which to train the agent.
- Developed algorithm for training a Markov Decision Process and successfully trained it to navigate the agent to the reward repeatedly.

Visualization of Markov Decision Process

- A table mapping states to actions according to a probability distribution.
- The probabilities in the table are what need to be learned by the algorithm.

	Action 1	Action 2
State 1	0.5	0.5
State 2	0.1	0.9

This state to action mapping is called the “policy” of the agent.

Still To Do

- Pick a Reinforcement Learning algorithm for training a Neural Network to control the agent.
- Deep Q Learning? Policy Gradients? Actor Critic? Lot's to consider!