Machine Learning Engineer Nanodegree

Smartcab

In your report, mention what you see in the agent's behavior. Does it eventually make it to the target location?

Random agent behavior has been implemented by following code:

```
# TODO: Update state

self.state = inputs['location']

self.heading=inputs['heading']

action = random.choice(Environment.valid_actions)

reward = self.env.act(self, action)
```

Agent is moving randomly (respecting the rules). But not reaching the target.

Justify why you picked these set of states, and how they model the agent and its environment.

As a set of states I've picked the following parameters:

- self.next_waypoint: next action suggested by simple planner
- Inputs['**light**']: traffic light
- Inputs['**oncoming**']: oncoming traffic
- Inputs['**left**']: traffic from the left

First parameter allows me to find the direction toward the goal. 3 other parameters give the opportunity to pick actions available in this environment. So on each timestep I have understanding where is my goal and which actions are permitted.

What changes do you notice in the agent's behavior?

The agent starts moving towards the goal and reaching the goal before the deadline.

Report what changes you made to your basic implementation of Q-Learning to achieve the final version of the agent. How well does it perform?

I made the following adjustments:
1) In order to eliminate cycles in car movements on the initial step, I've add 0.1 reward for planner recommendation action from the beginning.

2) I've put by default action is None (stay on the same place). So if max Q action is not permitted, the agent is staying on the same place. Ideally I should look into the Q table and pick 2nd best option.

Does your agent get close to finding an optimal policy, i.e. reach the destination in the minimum possible time, and not incur any penalties?

Yes: no movements of circles anymore and agent is staying on the same place when it is optimal. I've tried to vary alpha (from 0.1 to 0.9) but no major changes has been observed.