At the beginning of the learning process, the Q-network returns an arbitrary number. After a number of experiences, the algorithm updates Q so it converges to the expected discounted future reward. The structure with feeding the neural network a state s and defining the output of the network as a vector of Q functions for all possible actions from s.

In the Deep Q-learning, two neural networks are used: the Q-network and the target network. Every training iteration, the Q-network is updated by back-propagation and the earlier described update function. The target network is used when Q-values are calculated, and is an earlier copy of the Q-network.

尝试分析这些参数的含义

$ python3 pacman.py -p PacmanDQN -n 6000 -x 5000 -l smallGrid

A GameState specifies the full game state, including the food, capsules, agent configurations and score changes.

GameStates are used by the Game object to capture the actual state of the game and can be used by agents to reason about the game.

Much of the information in a GameState is stored in a GameStateData object. We strongly suggest that you access that data via the accessor methods below rather than referring to the GameStateData object directly.

Note that in classic Pacman, Pacman is always agent 0.

有一点很多好奇在于，如何控制界面的显示与训练过程。

Usage:

USAGE: python pacman.py <options>

EXAMPLES: (1) python pacman.py

- starts an interactive game

(2) python pacman.py --layout smallClassic --zoom 2

OR python pacman.py -l smallClassic -z 2

- starts an interactive game on a smaller board, zoomed in

Options:

-h, --help show this help message and exit

-n GAMES, --numGames=GAMES

the number of GAMES to play [Default: 6000]

-l LAYOUT\_FILE, --layout=LAYOUT\_FILE

the LAYOUT\_FILE from which to load the map layout

[Default: smallGrid]

-p TYPE, --pacman=TYPE

the agent TYPE in the pacmanAgents module to use

[Default: PacmanDQN]

-t, --textGraphics Display output as text only

-q, --quietTextGraphics

Generate minimal output and no graphics

-g TYPE, --ghosts=TYPE

the ghost agent TYPE in the ghostAgents module to use

[Default: RandomGhost]

-k NUMGHOSTS, --numghosts=NUMGHOSTS

The maximum number of ghosts to use [Default: 4]

-z ZOOM, --zoom=ZOOM Zoom the size of the graphics window [Default: 1.0]

-f, --fixRandomSeed Fixes the random seed to always play the same game

-r, --recordActions Writes game histories to a file (named by the time

they were played)

--replay=GAMETOREPLAY

A recorded game file (pickle) to replay

-a AGENTARGS, --agentArgs=AGENTARGS

Comma separated values sent to agent. e.g.

"opt1=val1,opt2,opt3=val3"

-x NUMTRAINING, --numTraining=NUMTRAINING

How many episodes are training (suppresses output)

[Default: 5000]

--frameTime=FRAMETIME

Time to delay between frames; <0 means keyboard

[Default: 0.1]

-c, --catchExceptions

Turns on exception handling and timeouts during games

--timeout=TIMEOUT Maximum length of time an agent can spend computing in

a single game [Default: 30]