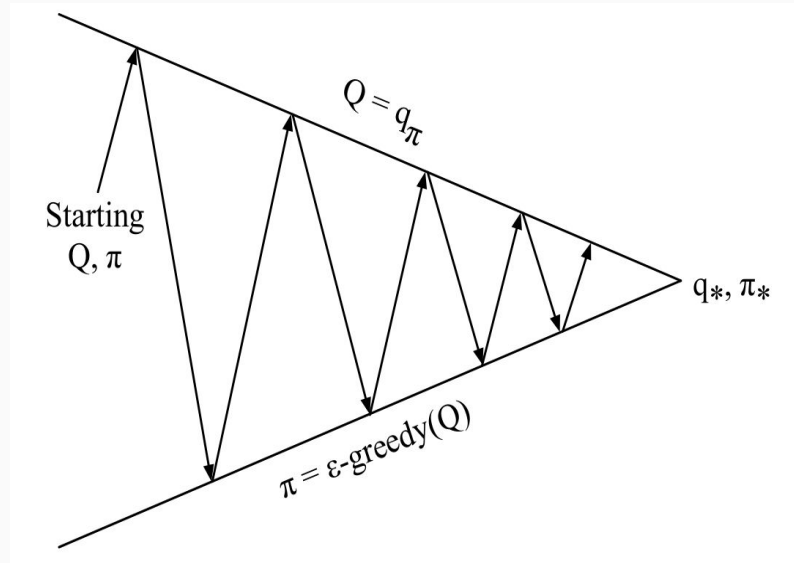# GLIE Monte Carlo Control

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# The problem with ϵ-greedy MC Control

- It keeps on doing exploration even after we have sufficiently explored the environment.

- We want our policy iteration to be absolutely greedy in order to satisfy our bellman optimality condition.

# *What is GLIE Monte Carlo Control*

- GLIE stands for Greedy in the Limit of Infinite Exploration.

- The policy iteration method where our policy improvement becomes absolutely greedy in the time limit of infinity.

- We slowly decrease the value of $\epsilon$ so that it becomes zero after many iterations.

# What does it ensure

1) It ensures that all state action pairs are visited infinite times as number of episodes tend to infinity.

$$\lim_{k \to \infty} N_k(s, a) = \infty$$

2) The policy iteration eventually becomes absolutely greedy

$$\lim_{k \to \infty} \pi_k(a|s) = \mathbf{1}(a = \operatorname*{argmax}_{a' \in \mathcal{A}} Q_k(s, a'))$$

# *Demonstration*

**DEMO TIME**

# *Questions*