**HW2**

**Step1: Question 1-4**

001-question1 Original code of value Iteration

002-question1 Write value iteration code

003-question1 Write code for computeQValueFromValues

004-question1 Write code for computeActionFromValues

005-question1 Frist try for running valueIterationAgents

006-question1 First try failed with errors in IF statement

007-question1 fix IF statement error with colon in computeActionFromValues

008-question1 still failed after fixing IF statement

009-question1 fix the space before statement self.values=t

010-question1 pass all test case

011-question1 output of GUI by running value iteration for 5 iterations

012-question1 output of GUI after 10 rounds of execution

013-question1 resulting average reward after the 10 rounds of execution

014-question2 Original code

015-question2 V-values under original settings

016-question2 original code cannot make agent cross bridge

017-question2 decrease noise=0.1

018-question2 noise=0.1 doesn't work

019-question2 decrease noise=0.05

020-question2 noise=0.05 doesn't work

021-question2 decrease noise=0

022-question2 noise=1 works

023-question2 V values under noise=0 and agent cross bridge

024-question2 Q values under noise=0 and agent cross bridge

025-question2 average returns under noise=0

026-question3a original code

027-question3a assign values to discount noise reward

028-question3a failed

029-question3a decrease noise=0.01

030-question3a works

031-question3a works and check in GUI

032-question3a works and terminates at exit 1 risking cliffs

033-question3b assign values to discount noise reward

034-question3b failed

035-question3b decrease discount=0.4

036-question3b failed

037-question3b decrease dicount=0.2

038-question3b works

039-question3b works and check in GUI

040-question3b works and terminates at exit 1 avoiding cliffs

041-question3c assign values to discount noise reward

042-question3c works

043-question3c works and check in GUI

044-question3c works and terminates at exit 10 risking cliffs

045-question3d assign values to discount noise reward

046-question3d failed

047-question3d decrease reward=-0.2

048-question3d works

049-question3d works and check in GUI

050-question3d works and terminates at exit 10 avoiding cliffs

051-question4e assign values to discount noise reward

052-question4e works

053-question3e works and check in GUI

054-question3e works and never terminate

055-question4 original code

056-question4 initialize Q-values

057-question4 create getQvalue function

058-question4 create computeValueFromQValues function

059-question4 create computeActionFromQValues function

060-question4 create getAction function

061-question4 create update function

062-question4 first try for running qlearningAgents

063-question4 first try with errors

064-question4 use correct getQValue for computeValueFromQValues

065-question4 use correct getQValue for computeActionFromQValues

066-question4 use correct getQValue for update

067-question4 pass tests

068-question4 check q-learner under manual control

069-question4 q-learner learns 1 episode

070-question4 q-learner learns 2 episodes

071-question4 q-learner learns 5 episodes

072-question4 q-learner learn 4 episodes with noise=0 and optimal path

073-question1 revise code for valueIteration on finding largest value

074-question1 revise code for computeActionFromValues on finding largest value

075-question4 revise code for computeValueFromQvalues on finding largest value

076-question4 revise code for computeActionFromQvalues on finding largest value

077-question1 revise code for valueIteration on inserting values in array

078-question1 revise code for computeActionFromValues and computeQValueFromValues on inserting values in array

079-question4 revise code for computeValueFromQvalues on inserting values in array

080-question4 revise code for computeActionFromQvalues on inserting values in array

081-question1 revise code for valueIteration on loop statement

082-question1 revise code for computeActionFromValues on loop statement

083-question4 revise code for computeValueFromQvalues on loop statement

084-question4 revise code for computeActionFromQvalues on loop statement

**Step 2: Visualize the evolution of V-value**

step2-001-initial V-value is 0

step2-002-V-value after 1 iteration

step2-003-V-value after 2 and 3 iteration

step2-004-V-value after 4 iteration

step2-005-V-value after 5 iteration

step2-006-V-value after 6 iteration

step2-007-V-value after 7 iteration

step2-008-V-value after 8 iteration

step2-009-V-value after 9 iteration

step2-010-V-value after 10 iteration

step2-011-V-value after 11 iteration

step2-012-V-value after 20 iteration

step2-013-V-value after 100 iteration

step2-014-data of V-value by excel

step2-015-V-Visualize the evolution of V-value by excel

step2-016-add code for storing V-value

step2-016-visulalize the evolution of V-value by pyplot

**Step 3: Visualize the evolution of Q-value**

step3-001- initial Q-value

step3-002-Q-value after 34 episodes

step3-003-Q-value after 56 episodes

step3-004-Q-value after 62 episodes

step3-005-Q-value after 102 episodes

step3-006-Q-value after 104 episodes

step3-007-Q-value after 106 episodes

step3-008-Q-value after 117 episodes

step3-009-Q-value after 121 episodes

step3-010-Q-value after 129 episodes

step3-011-Q-value after 140 episodes

step3-012-Q-value after 155 episodes

step3-013-Q-value after 159 episodes

step3-014-Q-value after 178 episodes

step3-015-Q-value after 186 episodes

step3-016-Q-value after 338 episodes

step3-017-Q-value after 454 episodes

step3-018-Q-value after 466 episodes

step3-019-Q-value after 490 episodes

step3-020-Q-value after 498 episodes

step3-021-Q-value after 575 episodes

step3-022-Q-value after 579 episodes

step3-023-Q-value after 606 episodes

step3-024-Q-value after 617 episodes

step3-025-Q-value after 646 episodes

step3-026-Q-value after 712 episodes

step3-027-Q-value after 787 episodes

step3-028-Q-value after 820 episodes

step3-029-Q-value after 853 episodes

step3-030-Q-value after 857 episodes

step3-031-Q-value after 863 episodes

step3-032-Q-value after 936 episodes

step3-033-Q-value after 1000 episodes

step3-034-data of Q-value by excel

step3-035-Visualize the evolution of Q-value by excel with noise=0

step3-036- run Q-value computing 1330 episodes with noise=0.2

step3-037-add code for storing Q-value

step3-038-Visualize evolution of Q-value by pylot with 400 iterations among 1330 episodes

step3-039-Visualize evolution of Q-value by pylot with noise=0.2