COMP7702 Artificial Intelligence (Semester 2, 2020)
Assignment 2: MDP in LASERTANK

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Question 1

a)

game_over_cost=-20

p = {0.5,0.7,0.9}

p = 0.5 → optimal policy is to turn left from initial state then keep performing shoot tank laser indefinitely.

p = 0.7 → optimal policy is to take the safe path around the obstacle.

p = 0.9 → optimal policy is to take the risky path along the cliff edge.

b)

p = 0.9

game_over_cost = {-15,-20,-25,-30}

game_over_cost = -15 → optimal policy is to take the risky path along the cliff edge.

game_over_cost = -20 → optimal policy is to take the risky path along the cliff edge.

game_over_cost = -25 → optimal policy is to take the risky path along the cliff edge.

game_over_cost = -30 → optimal policy is to take the risky path along the cliff edge.

c)

goc \ p	-15	-20	-25	-30
0.5	Alternate strategy	Alternate strategy	Alternate strategy	Alternate strategy
0.7	Risky path	Safe path	Safe path	Safe path
0.9	Risky path	Risky path	Risky path	Risky path

Question 2 (Complete your full answer to Question 2 on page 2)

a)

Synchronous VI:

1.9789 seconds

Modified PI:

3.5090 seconds

b)

Synchronous VI:

60 total iterations

Modified PI:

20 total iterations

c)

Synchronous VI:

Solution is not optimal, episode reward score = -100 but benchmark = -46 computed in 1 second and 33 iterations

Modified PI:

Solution is not optimal, episode reward score = -100 but benchmark = -46 computed in 1 second and 6 iterations

d)

Synchronous VI:

Solution is not optimal, episode reward score = -100 but benchmark = -46 computed in 0.3258 seconds and 10 iterations.

Modified PI:

Solution is not optimal, episode reward score = -100 but benchmark = -46 computed in 1.6990 seconds and 10 iterations.