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LAB 1

AIM

Implement fixed, random, reflex and memory operations in pioneer robot and 3 card poker game.

TASK 1

1.1 Pioneer Robot

In this operation we use pioneer robot and the robot consist three sensors. Two ultrasonic sensor on the left and right side to find the obstacles and also an energy sensor to collect the energy blocks.

1.2 Operations:

- ❖ FIXED
- ❖ RANDOM
- ❖ REFLEX
- ❖ REFLEX WITH MEMORY

1.2a Fixed agent

In this task we move the robot in a predefined path. We assign various speed in the different interval of time. The robot move we controlled by given conditions and move same direction in each time.

- ❖ if move constant speed: left speed = right speed
- ❖ if move to right side: left speed > right speed
- ❖ if move to left side: right speed > left speed
- ❖ if move to back: - left speed = - right speed
- ❖ if move circular way left peed = - right speed or - left peed = right speed

1.2b Random agent

in random action we use random function with a limit (example: random.randint (1,5)). so, the system chooses any random integer value between the limit and we assign the random value is motor speed. Then the robot moves random direction. Robot move different direction each time. It maybe strikes on the wall.

1.2c Reflex agent

Reflex agent is same as the reflex action. So the robot should not strike on the wall. Here we take the left, right and energy sensor reading then give some if, ifel and else conditions to avoid strike on the wall.

Example:

- ❖ if (left distance < 0.3 and right distance < 0.3)

left speed = 2 right speed = 4

- ❖ if (left distance < 0.3 and right distance < infinity)

left speed = 3 right speed = 2.4

- ❖ if (left distance < infinity and right distance < 0.3)

left speed = 2.4 right speed = 3

1.2d Agent with memory

agent with memory operation we store some data about the previous movement and also switch the movement to another agent. Actually this agent can be use to avoid the loop or moving same path of robot. We add a memory action with the reflex agent. It is done by set a timer (eg; 20) so when the reflex agent start to execute after every 20 second the robot speed reset to random action and when the random action collect an energy block then it reset and again start to execute reflex action.

TASK 2

2.1 Poker Player

Implement a three card two player poker game and also have three kind of hands the are 3 of a kind, pair and high card.

2.2 Operations:

- ❖ Fixed agent against random agent
- ❖ Reflex agent

2.2a Fixed agent against Random agent

Two agents random and fixed play against. we can see a small upper hand in random agent.

2.2b Reflex Agent

Here one player is reflex and the agent bid based on its hand. We can see reflex agent is more efficient to get more money than random agent.

- I. Bid highest for 3 of a kind hand
- II. Bid lower for pair hand
- III. Bid lowest for high rank hand

2.3 play:

- ❖ random vs reflex
- ❖ random vs fixed

Result

implemented the given task

Code:

- ❖ pioneer fixed agent
- ❖ pioneer random agent
- ❖ pioneer reflex agent
- ❖ pioneer agent with memory
- ❖ Poker Player fixed agent against random agent
- ❖ Poker Player reflex agent