CZ3005 Artificial Intelligence

Assignment 2

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# Tasks

## Task 1: Agent Localization and Mapping

The agent is always centered around the origin. When it receives an action sequence, it performs those actions relative to the origin. *Figure 1* shows the original position of the agent in the relative map at the start of the game. We observe that when given the instruction to move forward, the agent moves to (0,1, rnorth). This movement is shown in *Figure 2*, along with the output of current (X, Y) function. Figure 3 demonstrates that the agent correctly turns right and changes its current position to (0,1, reast).

Background pattern

Description automatically generated

Figure 1: Initial Position (0,0,rnorth)

Text

Description automatically generated with medium confidence Text

Description automatically generated with medium confidence

Figure 2: Moved to (0,1,rnorth) Figure 3: Turn right to (0,1,reast)

*Figure 4* shows the values of all the localization and mapping terms getting updated as the agent traverses the Wumpus world.

Text

Description automatically generated

Figure 4: Using localisation and mapping terms to confirm that the agent correctly maps the sensory information received to the corresponding relative coordinate

We thus, successfully verify the correctness of agent’s localisation and mapping abilities.

## Task 2: Agent’s sensory interface

- shoot kill Wumpus

- pickup ( gold .not gold)

Background pattern

Description automatically generated Background pattern

Description automatically generated

Figure 5: Agent moves forward Figure 6: Agent does not move forward   
 because it senses bump

Text

Description automatically generated Text

Description automatically generated

Text

Description automatically generated Text

Description automatically generated

Figure 7: facing Wumpus Figure 8: Executing shoot

## Task 3: Agent’s memory management and response to stepping in a Confundus Portal

## Task 4: Agent’s exploration capabilities

## Task 5: End Game Reset

## Task 6: Driver – differentiation between relative and absolute map

## Task 7: Ability to test viable agents

# Contribution

# Conclusion: What have we learned

1. We understood how HORN clauses and backtracking work in prolog.
2. We also learned how Knowledge Base Representation language works.
3. Learned how to apply First Order Logic and Propositional Logic.
4. We implemented iterative deepening search in Prolog for explore(L).

# References