**Description**

In this phase we design and implement a simple agent to walk through and collect Gold from the WumpusWorld. We will not go through the rules of the game, as we discussed it in the class, but we will focus on the logic and implementation of this agent.

First, we should clarify some critical points in our implementation:

- As the game required getting Gold and climbing out the cave as fast as possible, we use Breadth-First-Search to facilitate the traversal of our agent and get the shortest to distance to different targets from different sources.

- We implement a generator so that every time the game is run new World will be generated.

- We define some variables to help the agent represent knowledge he gains while traversing the WumpusWorld:

• Bx,y : the cell (x,y) is Breezy.

• Sx,y : the cell (x,y) has a Stench.

• Px,y : the cell (x,y) contains a Pit.

• Wx,y : there is Wumpus residing is cell (x,y).

The most important part in our implementation is the KnowledgeInference class, this class is responsible for storing Facts and derives new Facts from the knowledge the agent acquired while traversing the Map. This class is divided into two major parts:

- Facts: this part represents the Facts the agent has, either from his exploration or by deriving new Facts from already stored Facts and rules.

- Rules: this describe the rules that define the environment the agent interacting with, In our Wumpus World a rule can be formulated as:

𝐵, → 𝑃+1, ∨ 𝑃−1, ∨ 𝑃,+1 ∨ 𝑃,−1

We use this class to predict the state of the next cell the agent is going to visit, and as a result this class will give our agent the property to be a Knowledge-Based Agent.

**Results**

After run the program for 50 times:

Number of kills caused by Pits : 16

Number of kills caused by Wumpus : 0

Number of time get Negative Score : 16

Number of time get Postive Score : 34

Max Postive Score : 1600

Max Run Time : 18.737000

**Our work was divided as the following:**

1- Implementing the main part of the WumpusWorld and designing KnowledgeInference class

is done by Abdalrahman Ali.

2- Implementing BFS class and the Map generator is done by Yousef Darwish.