Approach

1. The Wumpus World problem is solved by using propositional logic sentences and drawing inferences on these sentences. The propositional logic sentences are saved in the knowledge base in CNF form.
2. DPLL Algorithm, with 4 heuristics: Early termination, Pure symbol heuristic, Unit clause heuristic and Degree heuristic, has been used to find which rooms are safe by drawing inferences on knowledge base.
3. Following clauses are added initially in the knowledge base:
   a. There is at least 1 Wumpus and 1 Pit in the world.
   b. There is at most 1 Wumpus and 1 Pit in the world.
   c. For all [i, j], $B_{i,j} \iff P_{i+1,j}$ or $P_{i,j+1}$ or $P_{i-1,j}$ or $P_{i+1,j}$ (only if the coordinates exist)
   d. For all [i, j], $S_{i,j} \iff W_{i+1,j}$ or $W_{i,j+1}$ or $W_{i-1,j}$ or $W_{i+1,j}$ (only if the coordinates exist)
   e. There is no wumpus or pit in Room [1,1].
4. At each step, the agent tries to infer something about his next move, based on propositional logic and the knowledge base it has.

Simulation

1. The agent starts at Room [1,1].
2. At each step in the Wumpus world, the agent perceives the presence/absence of breeze and stench in that room and add respective clauses to knowledge base. (presence/absence of breeze/stench)
3. After that, KB entails (Pit or Wumpus) is checked for all unvisited rooms using DPLL Algorithm. If the DPLL algorithm returns unsatisfiable, then we surely know that the room is safe and the agent tries to reach that room (if possible) through already visited rooms using DFS. If the room isn't reachable, then agent tries to find some other room that is safe.
4. This is repeated until the agent reaches Room [4,4].

Effect of different heuristics on DPLL calls

Following results are obtained on wumpus world given in Agent.py:

DPLL Algorithm	Number of DPLL function calls
Using all 4 heuristics	1601
Excluding Pure heuristic	1562
Excluding Unit heuristic	29211
Excluding Early termination heuristic	8084
Excluding degree heuristic	1601