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| **Experiment 1** | |
| **AIM :** | Implement an Intelligent agent (problem formulation and implementation)  Missionaries and Cannibal Problem:   * In the missionaries and cannibals’ problem, three missionaries and three cannibals must cross a river using a boat which can carry at most two people, under the constraint that, for both banks, if there are missionaries present on the bank, they cannot be outnumbered by cannibals (if they were, the cannibals would eat the missionaries). The boat cannot cross the river by itself with no people on board. |
| **Code:** | boat\_side = "Right"  missionary\_on\_right = 3  cannibals\_on\_right = 3  missionary\_on\_left = 0  cannibals\_on\_left = 0  def print\_state():      print(f"Missionaries on left = {missionary\_on\_left} Cannibals on left = {cannibals\_on\_left}", *end*='')      print(" |-----Boat| " *if* boat\_side == "Right" *else* " |Boat-----| ", *end*='')      print(f"Missionaries = {missionary\_on\_right} Cannibals on right = {cannibals\_on\_right}")  print\_state()  *while* True:      missionary = int(input(f"Enter number of Missionary in boat on {boat\_side}: "))      cannibals = int(input(f"Enter number of Cannibals in boat on {boat\_side}: "))    *# Condition for peoples on boat should be 1 or 2 only.*  *if* (missionary + cannibals) not in [1, 2]:          print("Invalid move: Total people in boat must be 1 or 2")  *continue*    *if* boat\_side == "Right":  *if* missionary > missionary\_on\_right or cannibals > cannibals\_on\_right:              print("Invalid move: Not enough people on the right side")  *continue*            missionary\_on\_right -= missionary          cannibals\_on\_right -= cannibals          missionary\_on\_left += missionary          cannibals\_on\_left += cannibals          boat\_side = "Left"  *else*:  *if* missionary > missionary\_on\_left or cannibals > cannibals\_on\_left:              print("Invalid move: Not enough people on the left side")  *continue*            missionary\_on\_right += missionary          cannibals\_on\_right += cannibals          missionary\_on\_left -= missionary          cannibals\_on\_left -= cannibals          boat\_side = "Right"        print\_state()    *# These condition checks whether condition for win is not satisfied i.e. you loose*  *if* (missionary\_on\_right != 0 and missionary\_on\_right < cannibals\_on\_right) or \         (missionary\_on\_left != 0 and missionary\_on\_left < cannibals\_on\_left):          print("YOU LOSE")  *break*    *# These condition checks whether condition for win is satisfied i.e. you win*  *if* missionary\_on\_left == 3 and cannibals\_on\_left == 3:          print("YOU WIN")  *break*  print("GAME OVER") |
| **OUTPUT:** |  |
| **PEAS for problem:** | 1. **Performance Measure:**  * Successfully moving all missionaries and cannibals to the left side of the river * Avoiding any state where cannibals outnumber missionaries on either side * Minimizing the number of moves required to complete the task.  1. **Environment:**  * The river with two banks (left and right) * Three missionaries and three cannibals * A boat that can carry one or two people * States of the environment change based on the movements of missionaries and cannibals.  1. **Actuators:**  * The ability to move the boat from one side to the other * The ability to load and unload missionaries and cannibals onto/from the boat.  1. **Sensors:**  * The ability to count the number of missionaries and cannibals on each side of the river * The ability to determine the current location of the boat * The ability to check if the current state is valid (i.e., missionaries are not outnumbered by cannibals) |
| **CONCLUSION:** | Hence by completing this experiment I came to know about Implement an Intelligent agent (problem formulation and implementation) Missionaries and Cannibal Problem. |