**SHRI RAMDEOBABA COLLEGE OF ENGINEERING &MANAGEMENT, NAGPUR**
**Department of Computer Science & Engineering**

# *Assignment (Session 2019-20)*

**Course:** Artificial Intelligence **Course Code:** CST323
**Class-Section :** VI-I **Last Date of Submission**: 25/02/2020

**Instructions**

1. This assignment carries SIX marks
2. Problem no. 1 to 7 is required to submit individually.
3. Problem no. 8 to 11 is required to submit in the group of TWO. Allocated students in particular problem must form a group of TWO by their own.
4. All the assignment should be verified with undersigned before final submission.
5. Final submission will be in soft form only.
6. Two or more similar submissions will be assigned ZERO marks

**Evaluation Criteria:**

SIX marks will be individually assigned based on following parameters.

1. Demonstration (with all the functionalities) : 1 / 2 / 3 / 4 marks
2. Originality in submission : 0 / 1 / 2 marks

| Problem No | Problem Definition | Roll Nos |
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| 1 | The aim of the project is to create GUI, where Romania map will be taken as an input. **Apply Breadth first search algorithm** on Romania map and show the solution in each step. Give a provision to select any source and destination by the user. On clicking "SUBMIT" button, algorithm execution will be visualized on the screen. | 4,14, 24,34, 44 |
| 2 | The aim of the project is to create GUI, where Romania map will be taken as an input. **Apply Depth first search algorithm** on Romania map and show the solution in each step. Give a provision to select any source and destination by the user. On clicking "SUBMIT" button, algorithm execution will be visualized on the screen. You can use different colors to represent each step. Final state will be represented by "BLUE" color. | 64,84, 5,15, 25 |
| 3 | The aim of the project is to create GUI, where Romania map will be taken as an input. **Apply Uniform cost search algorithm** on Romania map and show the solution in each step. Give a provision to select any source and destination by the user. On clicking "SUBMIT" button, algorithm execution will be visualized on the screen. You can use different colors to represent each step. Final state will be represented by "BLUE" color. | 65,75, 85,6, 16 |
| 4 | The aim of the project is to create GUI, where Romania map will be taken as an input. **Apply Best first search algorithm** on Romania map and show the solution in each step. Give a provision to select any source and destination by the user. On clicking "SUBMIT" button, algorithm execution will be visualized on the screen. You can use different colors to represent each step. Final state will be represented by "BLUE" color. | 36,46 56,66, 76 |

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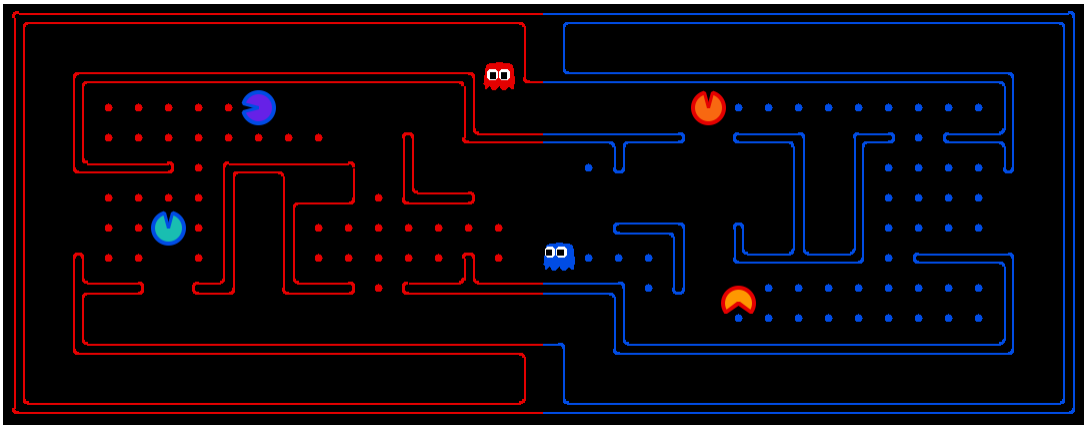
| 5 | The aim of the project is to create GUI, where Romania map will be taken as an input. **Apply A* algorithm** on Romania map and show the solution in each step. Give a provision to select any source and destination by the user. On clicking "SUBMIT" button, algorithm execution will be visualized on the screen. You can use different colors to represent each step. Final state will be represented by "BLUE" color. | 7,17, 27,37, 47, |
| 6 | The aim of the project is to create GUI, where Romania map will be taken as an input. **Apply Iterative Deepening Depth first search algorithm** on Romania map and show the solution in each step. Give a provision to select any source and destination by the user. On clicking "SUBMIT" button, algorithm execution will be visualized on the screen. You can use different colors to represent each step. Final state will be represented by "BLUE" color. | 57,67, 77,8, 18 |
| 7 | Monkey Banana Problem is stated as given: A monkey and a bunch of banana are present in a room. The bananas are hanging from the ceiling. The monkey cannot reach the bananas directly. However, in the room there is one chair and a stick. The monkey can reach the banana standing on the chair. The aim of the problem is to find the sequence of events by which monkey can reach the bananas<br>Find out total number of moves required for Breadth First Search, Depth First Search, Uniform Cost Search, Best First Search and A* Algorithm. Define appropriate heuristic for solving the problem. | 28,38, 48,58, 68 |
| 8 | Consider following PacMan problem.<br>  <br>**Layout:** The Pac-Man map is now divided into two halves: blue (right) and red (left). Red agents (which all have even indices) must defend the red food while trying to eat the blue food. When on the red side, a red agent is a ghost. When crossing into enemy territory, the agent becomes a Pac-Man.<br><br>**Scoring:** When a Pac-Man eats a food dot, the food is permanently removed and one point is scored for that Pac-Man's team. Red team scores are positive, while Blue team scores are negative.<br><br>**Eating Pac-Man:** When a Pac-Man is eaten by an opposing ghost, the Pac-Man returns to its starting position (as a ghost). No points are awarded for eating an opponent. Ghosts can never be eaten.<br><br>**Winning:** A game ends when one team eats all but two of the opponents' dots. | 1,12, 21,32 42,52, 61,72, 82,74 |

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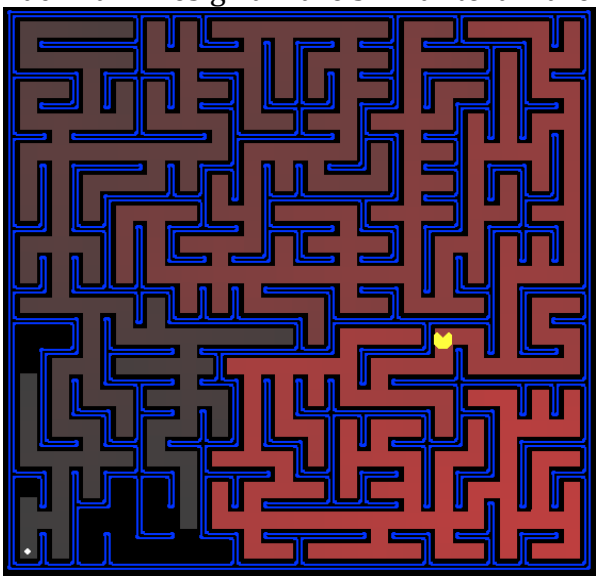
| | Games are also limited to 3000 agent moves. If this move limit is reached, whichever team has eaten the most food wins.<br><br>**Computation Time:** Each agent has 1 second to return each action. Each move which does not return within one second will incur a warning. After three warnings, or any single move taking more than 3 seconds, the game is forfeit. There will be an initial start-up allowance of 15 seconds.<br><br>**Observations:** Agents can only observe an opponent's configuration (position and direction) if they or their teammate is within 5 squares (Manhattan distance). In addition, an agent always gets a noisy distance reading for each agent on the board, which can be used to approximately locate unobserved opponents.<br><br>Find out the winner of the game and time required for complete computations. Develop a GUI to show the execution. | |
| 9 | PackMan : Design a Maze similar to a Maze as given below,<br>  <br>Your Pac-Man agent will find paths through his maze world, to reach a particular location. Aim of the assignment is to find a path to the goal by Breadth First Search. Show the intermediate solution and also show the final path at the end. | 3,13,<br>23,33<br>43,53,<br>63,73,<br>83,55 |
| 10 | For the problem no 9, find a path to the goal by Depth First Search. Show the intermediate solution and also show the final path at the end. | 10,19,<br>29,39,<br>49,59,<br>70,78, |
| 11 | For the problem no 9, find a path to the goal by Best First Search. Show the intermediate solution and also show the final path at the end. | 11,20,<br>31,40,<br>50,60,<br>71,79,<br>41,51 |

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| 12 | Prepare a dataset of student's attendance in different subjects for last THREE years. Total 1000 students' record is to be created. For each student, there will be FIVE subjects in each year. Categories these fifteen subjects in [Numerical, Theoretical, Programming] categories. Your aim is to predict the attendance of student in fourth year in all the three subject categories. | 54,35, 26, 81 |

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Course Cordinator