BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS
Artificial Intelligence (BITS F444/ CS F407)
I Semester 2018-19
Programming Assignment-1
Coding Details
(September 10, 2018)

Instruction: Type the details precisely and neatly

1. ID _____2015B4A70602P_____
Name _____ABHINAV GUPTA_____

2. Mention the names of Submitted files :
    a. <AI.pdf>
    b. <Functions.py>
    c. <goal_state.py>
    d. <GUI2.py>
    e. <Initial_state.py>
    f. <main_AI.py>

3. Total number of submitted files: _____6_____
4. Name of the folder :_____project1_____
5. Have you checked that all the files you are submitting have your name and ID (in comments) in the top?(yes/no) yes
6. Have you checked that all the files you are submitting are in the folder as specified in 4 (and no subfolder exists)?(yes/no) yes

7. Problem formulation
    a. State representation: Sticks are numbered such that all horizontal sticks get numbered first and then we come to vertical sticks total 40 sticks have to be numbered for 4x4

    b. How is the Initial state generated? I have selected random cell on which I am square of random size if it is possible to make . I am using set to store which cells are already filled.

    c. What is the goal state? In goal states number of squares can be 0 or 1 .

    d. Are there more than one goal states? Yes for different size of boxes

    e. How have you created the goal states for 1, 2 and 3 squares in the goal states? (manually/ automated) Manually ,stored the goal states for one and two squares

    f. Mention the numbers of goal states possible for 1, 2 and 3 squares separately.
        - For 1 square in the goal state: _____30_____
        - For 2 squares in the goal state: _____254_____
        - For 3 squares in the goal state: _____

    g. State representation in Python (name the construct and give one small example of a state)

8. coveragePercentage: In function initialStateGenerator (gridSize n, coveragePercentage p), what is your interpretation and usage of p? Does p refer to the percentage coverage area of the complete grid or percentage of maximum n^2 squares? _____p is percentage covered area of the complete grid_____
   _____ _____ _____
   _____

9. Goal test: Describe the logic used in implementing goal test. Also describe any additional data structures used to store the goal states. All 1 square state then all 2 square .

10. Time for goal test: Mention the time complexity of goal test implemented by you. _____size*size_____
11. Are you creating the goal states automatically every time you are applying the goal test? (yes/No) Why?
    _____ YES_____
    _____ _____

12. Define your understanding of a move in the given problem:_____depending on the target squares_____
13. What is the branching factor (maximum)?___ NUMBER OF 1 IN IN INITIAL STATE_____
14. Successor function description

15. Uninformed Search Technique (T1) details
    a. Technique used for search: DFS

    b. Reason for selecting this technique over the other two: FAST

    c. Is the search applied on match sticks, squares or on states? STATES
    d. Error handling and reporting (yes/No): YES
    e. List the errors handled:NO POSSIBLE ANSWER/ INFINITE LOOP
    f. Data Structure description for the tree node (in maximum two lines): STRUCTURE STORING CHILD ARRAY ,CURRENT CHILD ARRAY INDEX AND STATE OF STICKS
    g. Code status (implemented fully/ partially/ not done)FULLY
16. Uninformed search Technique (T2) details:
    a. Technique used for search:BFS
    b. Reason for selecting this technique over others:EASY TO IMPLEMENT
    c. Does this technique look at a square or a match stick? STATES/MATCHSTICK
    d. Does this technique use a state?YES
    e. Code status (implemented fully/ partially/ not done)FULLY
17. GUI details
    a. Created the GUI (yes/ N0):YES FOR DFS/INITIAL STATE AND BFS
    b. Have created it according to the specifications?(yes/No)NO
    c. Which module of Python is used for creating graphics? TURTLE
    d. Is this under the standard Python library or not?YES
    e. If not, why?
    f. Are the window panes working independently?MADE GRAPHICS ONLY FOR INITIAL STATE AND PATH REMOVAL FOR DFS AND BFS
18. Graphics details:
    a. Is turtle graphics working fine for removal of the match stick? yes
    b. How are you creating the environment of the intelligent agent? By coloring the sticks with same color as background
    c. How are you showing the matchsticks? using lines and dots

d. Are you showing the removal of a match stick graphically as per the action path produced by T1 ? Describe the turtle actions appropriately. I am coloring the stick mentioned in action path with same color as background and there is no separate window you have to enter 2 to see working of DFS
e. Are you showing the removal of a match stick graphically as per the action path produced by T2 ? Describe the turtle actions appropriately. Enter 1 to see working of BFS

19. Compilation Details:
    a. Code Compiles (Yes/ No):_____YES_____
    b. Mention the .py files that do not compile:_____
    c. Any specific function that does not compile:_____
    d. Ensured the compatibility of your code with the specified Python version(yes/no)_____
    e. Instructions for compilation of your files mentioning the multi file compilation process used by you (We may use the replica of these for compiling your files while evaluating your code)RUN main_AI.py AND ENTER 1 IF YOU WANT TO SEE INITIAL STATE ,ENTER 2 IF YOU WANT TO RUN DFS AND ENTER 3 TO RUN BFS

20. Driver Details: Does it take care of the options specified earlier(yes/no):____YES_____
21. Execution status (describe in maximum 2 lines)
    DFS /Initial state and BFS run fine but BFS is relatively slow

22. Output Details
    a. Copy and paste the output of three graphs G1-G3 here

G1

G2

G3

Write some more details here for the above graphs, if needed

b. Write the following values computed by you (refer the details of R1-R11 in the assignment document). Use appropriate units for the values

R1:	R2:	R3:	R4:
R5:	R6:	R7:	R8:
R9:	R10:	R11:	R12:

23. Declaration: I, _____Abhinav Gupta_____ (name) declare that I have put my genuine efforts in creating the python code for the given programming assignment and have submitted only the code developed by me. I have not copied any piece of code from any source. If the code is found plagiarized in any form or degree, I understand that a disciplinary action as per the institute rules will be taken against me and I will accept the penalty as decided by the department of Computer Science and Information Systems, BITS, Pilani.

ID_____2015B4A70602P_____

Name:_____ABHINAV_____

Date: _____

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Should not exceed 5 pages