**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI**

Batch No. :

**DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS**

**Artificial Intelligence (BITS F444/ CS F407)**

**I Semester 2019-20**

**Programming Assignment-1**

**Coding Details**

**(September 10, 2019)**

*Instruction: Type the details precisely and neatly*

1. ID \_\_2017A7PS0068P \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name \_\_\_J LAKSHMI TEJA\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Mention the names of Submitted files :
   1. <driver.py>
   2. <gen.py>
   3. <bfs.py>
   4. <dfs.py>
   5. <gui.py>
   6. <DirtGenerator.py>
2. Total number of submitted files: \_\_\_\_6\_\_\_\_\_\_\_
3. Name of the folder :\_\_\_\_\_\_\_\_2017A7PS0068\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Have you checked that all the files you are submitting have your name in the top? YES
5. Have you checked that all the files you are submitting are in the folder as specified in 4 (and no subfolder exists)? YES
6. Problem formulation
   1. State representation:

Position of dirt and vacuum cleaner

* 1. How is the Initial state generated?

Both dirt and vacuum cleaner’s positions are randomly generated

* 1. What is the goal state?

All the elements in the nxn array should be 0. The vacuum cleaner’s position should be any one of (0,0), (n,n), (0,n) and (n,0)

* 1. Are there more than one goal states?

Yes

* 1. If yes, then describe all the goal states

One goal state for vacuum cleaner at each corner of the room

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

A tuple of nxn array and 1 x2 array. The nxn array is an array of 0’s and 1’s where 1 represents dirt positions and 0 represents no dirt. The 1x2 array has the position of the vacuum cleaner.

Ex. ( [[0,1], [1,0]] , [0,1])

1. Successor function description

The position is changed if move command given accordingly. Else, if the command is to suck, the current position’s value is made 0 in the nxn array. The function is called only when the move is within bounds

1. BFS (T1) details
   1. Is the search applied on tiles or on states?

States

* 1. Error handling and reporting (yes/No):

Yes

* 1. List the errors handled:

Memory out of range

* 1. Data Structure description for the tree node (in maximum two lines):

A tuple of the state and a list of commands to reach that state

* 1. Code status (implemented fully/ partially/ not done)

Implemented fully

* 1. Maximum depth reached before the failed memory allocation, if happened any?

5

* 1. Maximum room size you are able to handle to reach the goal state within available memory and reasonable time:

5

* 1. Other limitations of the technique:

1. IDS (T2) details:
   1. Is the search applied on tiles or on states?

States

* 1. Error handling and reporting (yes/No):

Yes

* 1. List the errors handled:

Memory out of range

* 1. Data Structure description for the tree node (in maximum two lines):

A tuple of the state and a list of commands to reach that state

* 1. Code status (implemented fully/ partially/ not done)

Implemented fully

* 1. Maximum depth reached before the failed memory allocation, if happened any?

None

* 1. Maximum room size you are able to handle to reach the goal state within available memory and reasonable time:

5

* 1. Other limitations of the technique:

1. GUI details
   1. Created the GUI ?(yes/ N0): Yes, but not fully and not working
   2. Have you created it according to the specifications?(yes/No)
   3. Which module of Python is used for creating graphics? Turtle
   4. Is this under the standard Python library or not? Yes
   5. If not, why?
   6. Are the window panes working independently?
2. Graphics details:
   1. Is turtle/PyQT graphics working fine for movement of the intelligent vacuum cleaner?
   2. How are you creating the room tiles? Ran a loop nxn times and drew the squares
   3. How are you showing the dirt? Blue circles
   4. How are you showing the resting position of the vacuum cleaner?
   5. Are you showing the movement of the vacuum cleaner (turtle cursor) as the execution of T1 goes on? Why or why not? No, couldn’t implement
   6. Are you showing the movement of the vacuum cleaner (turtle cursor) as the execution of T2 goes on? Why or why not? No, couldn’t implement
   7. Which functions of Matplotlib are you using?
   8. Are you using any other library such as NUMPY other than the standard Python, PyQT5 and Matplotlib? No
   9. Any other details:
3. Compilation Details:
   1. Code Compiles (Yes/ No):\_\_\_\_\_\_\_Yes\_\_\_\_\_\_\_
   2. Mention the .py files that do not compile:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Any specific function that does not compile:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Ensured the compatibility of your code with the specified Python version(yes/no)\_\_\_Yes\_\_\_\_\_\_\_\_\_
   5. 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)
4. Driver Details: Does it take care of the options specified earlier(yes/no):\_\_\_\_\_Only option 2 and 3\_\_\_\_\_\_
5. Execution status (describe in maximum 2 lines)
6. Output Details
   1. Copy and paste the output of four graphs G1-G4 here

G1

G2

G3

G4

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

* 1. 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:

1. Declaration: I, \_\_\_\_\_\_\_\_\_\_J Lakshmi Teja\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_2017A7PS0068P\_\_\_\_\_\_\_\_\_\_\_\_\_

Name:\_\_\_J Lakshmi Teja\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_10/9/2019\_\_\_\_\_\_

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