BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS

Artificial Intelligence (BITS F444/ CS F407)

I Semester 2019-20

Programming Assignment-4

Coding Details

(November 1, 2019)

Instruction: Type the details precisely and neatly

1. ID ____2017A7PS0171P____
   Name ______PRATEEK SHARMA____

2. Mention the names of Submitted files :UPDATEDFINAL.PY

3. Total number of submitted files: __1
4. Name of the folder :____2017A7PS0171P_AI4
5. Have you checked that all the files you are submitting have your name 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. List of variables (Specify all variables):

   ANS:VARIABLES ARE FACULTY MEMEBERS THAT ARE COMING TO MEET STUDENTS
   N1,N2,---N20

   b. Value domains of variables (Also list the variables against each value domain correspondingly):TIME SLOTS GIVEN ARE THE DOMAINS VALUE

   c. Mention the constraints :TWO FACULTY IN A SAME GROUP CANNOT CONDUCT SESSION IN THE SAME TIME SLOT

8. Data structure used

a. Constraint graph node structure: ADJACENCY LIST WITH THE HELP OF 2-DIMEMSION LIST,ELEMENTS ARE NODES

b. Constraint graph edge structure:

TWO ELEMENTS IN A SAME ADJACENCY LIST ARE CONNECTED BY A SINGLE EDGE

c. Constraint graph (Adjacency list/ adjacency matrix/ any other(specify)

ADJACENCY LIST

d. How are you maintaining value domains as you go with search process?NOT CHANGING FOR SIMPLE BACTRACKING, FOR AC3 DOMAIN PRUNS ACCORDING TO AC3

9. DFS + backtracking technique details

   a. Variable ordering used (List heuristics used):NO

   b. Node structure for DFS: A LIST OF SIZE OF NUMBER OF FACULTY

   c. Method for assignment of a value to a variable and backtracking:def dfs_bt(assgn,adjlist,domain,g,no):

```
    l=findemptylocation(assgn,no)
    if(l==-1):
        return True
    for i in range(len(domain[l])):
        ele=domain[l][i]
        if(safeassgn(assgn,ele,adjlist,l)):
            assgn[l]=ele
            if(dfs_bt(assgn,adjlist,domain,g,no)):
                return True
            assgn[l]=0
    return False
```

ANS:GO INSIDE THE RECURSION UNTILL YOU GET A UNSAFE ASSIGNMENT(VIOLATING THE CONSTRAINTS) AND BACKTRACK AND CHOOSE DIFFERENT VALUE FROM DOMAIN.

o. How is edge node of your adjacency list (constraint graph) useful in deciding upon which constraint module(or modules) to use for testing the violation of the constraints while you assign a value to a variable?

p. Total number of nodes generated for assignment of values to all variables:1723582

q. Write the statistics here as asked

R1 = 1723582 R2 = R3 = 20
R4 = 12secs R5=

r. Code status (implemented fully/ partially/ not done)-fully implemented

10. DFS+ Backtracking using constraint propagation:

a. Explain the method for constraint propagation. How are you updating the value domains? What do you do with the value domains of the variables when you backtrack while performing DFS?

FOR VALUE I AM CHECKING THROUH THIER DOMAINS IF THERE IS ANY VALUE PRESENT IN THE DOMAIN WHICH IS NOT CONSISTENT WITH THE NEIGHBOURS (CHECKING ONE BY ONE) REMOVE THAT VALUE , CHECK THE NEIBHOURS AGIN AFTER ANY CHANGE

b. Total number of nodes generated using the above technique-26

c. Write the statistics here as asked

R6 = 26 R7 = 0.99 R8 = 0.015

d. Code status (implemented fully/ partially/ not done)fully implemented

11. Comparative analysis

Fill in the following information

	DFS+BT	DFS+BT+Constraint propagation
Average number of nodes created	17lakh	25
Average time taken	15secs	0.015

12. Compilation Details:

a. Code Compiles (Yes/ No):_______YES_______
b. Mention the .py files that do not compile:_____________NONE_______________________________
c. Any specific function that does not compile:__________NONE______________________________
d. Ensured the compatibility of your code with the specified Python version(yes/no)_________YES___

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)-SINGLE FILE COMPILE THAT FILE

13. Driver Details: Does it take care of the options specified earlier(yes/no):________YES___
14. Execution status (describe in maximum 2 lines)SINGLE FILE ONLY, RUN THAT FILE

15. Declaration: I, __________________PRATEEK__________ (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______________________________ Name:___________PRATEEK
SHARMA_______________

Date: ________1-NOV-2019______
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Should not exceed four pages