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

Batch No. :

**DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS**

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

**I Semester 2017-18**

**Programming Assignment-3**

**Coding Details**

**(October 26, 2017)**

*Instruction: Type the details precisely and neatly*

1. ID 2015A7PS0102P

Name K S Sanjay Srivastav

1. Mention the names of Submitted files :
   1. 2015A7PS0102P.docx
   2. preprocessing.py
   3. constraints.py
   4. techniques.py
   5. nestedfor.py
   6. main.py
   7. testcasefile.csv
   8. constraintGraph.pdf
2. Total number of submitted files: 8
3. Name of the folder : 2015A7PS0102P
4. Have you checked that all the files you are submitting have your name in the top?(yes/no) 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/no)yes
6. Problem formulation
   1. List of variables (Specify all variables):

Courselist=[“C\_01”,”C\_02”,………”C\_11”,”C\_12”,…….]

Ltp=[[#lectures of course1,#tutorials of course1,#practicals of course1],

[#lectures of course2,#tutorials of course2,#practicals of course2],

……]

* 1. Value domains of variables (Also list the variables against each value domain correspondingly)

Domain={“C\_01”:[11,12,13,14,16,17,18,21,22,23,24,26,27,28,……..61,62,63,64],

”C\_02”:[ 11,12,13,14,16,17,18,21,22,23,24,26,27,28,……..61,62,63,64],

……….

}

* 1. Constraint graph : Draw the constraint graph neatly on a separate A3 paper. Encircle the variables to represent the nodes and label each edge with appropriate constraints numbered from 1 to 11 as mentioned in the problem specification document. Upload the scanned copy of the above hand drawn constraint graph as file **constraintGraph.pdf**.

Have you uploaded the scanned copy as above? Yes/No Yes

* 1. Specify the number of nodes in your constraint graph. 12
  2. Specify the number of edges in your constraint graph. 59
  3. How do you use the package information in constructing the constraint graph?

The student-package information is used to make links between the nodes because for one package no two classes i.e. including lectures, tutorials and practicals cannot be held at the same time.

* 1. How do you use professor-courses packages in your constraint graph?

Using the professor-courses package, I made links between the courses that they cannot be taught at the same time as the professor cannot be at both classes simultaneously

1. Data structure used
   1. Constraint graph node structure:

Every node is a list of courses, this courses is associated(constrained) with.

* 1. Constraint graph edge structure:

No implicit edge structure.

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

Adjacency list

1. DFS + backtracking technique details
   1. Variable ordering used:

C\_01 to C\_12

* 1. Node structure for DFS:

A list of lists where each list indicates the allotment of lectures, tutorials and practicals of all courses correctly assigned till now.

* 1. Method for assignment of a value to a variable and backtracking:

A nested for loop generator gives all possible ltp values from domain of the course and the constraint checking will be done to check the validity.

* 1. 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?

It is not because I am checking all the constraint to proceed.

* 1. Total number of nodes generated for assignment of values to all variables: 12
  2. Write the statistics here as asked

R1 = R2 = R3 =

R4 = R5=

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

1. DFS+ Backtracking using constraint propagation:
   1. 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?

When the variable list passes all the constraints, that means it is a contender for a valid assignment till that point and hence domain of other unassigned courses will now be deprived of the assigned values to this course i.e. all ltp values assigned.

* 1. Total number of nodes generated using the above technique
  2. Write the statistics here as asked

R6 = R7 = R8 =

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

1. Comparative analysis

Fill in the following information

|  |  |  |
| --- | --- | --- |
|  | DFS+BT | DFS+BT+Constraint propagation |
| Average number of nodes created |  |  |
| Average time taken |  |  |

1. Output files
   1. Created the output files testcase#\_DFS\_BT.txt and testcase#\_DFS\_BT\_CP.txt (yes/ No):No
   2. Have named the files according to the specifications?(yes/No):No
   3. Created the file constraintGraph.pdf (yes/no): yes
2. 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) python main.py
3. Driver Details: Does it take care of the options specified earlier(yes/no):yes
4. Execution status (describe in maximum 2 lines) It is taking a lot of time and space and has never completed the execution in my test runs but there were no errors either.
5. Declaration: I,K S Sanjay Srivastav (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 2015A7PS0102P Name: K S Sanjay Srivastav

Date:26-10-2017

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