CSE 413 – ARTIFICIAL INTELLIGENCE

SUBJECT ALLOCATION OF FACULTY MEMBERS

GROUP: 6

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SUBMITTED TO:

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Introduction:-

(i)Problem Statement:

In any educational institute, the timetable committee has to assign subjects to faculty before starting the new academic year. In this process the subject allocation committee has to take many points into consideration such as interests of faculty in a subject, capability of the faculty to take newly introduced challenging subject, availability of faculty, and some other points. The subject allocation committee has to do tiresome, complex manual work which takes a lot of time to analyse before assigning any subject to any faculty.

(ii)Constraint Satisfaction Problem (CSP):

- Constraint satisfaction is a technique where a problem is solved when its value satisfies certain constraints or rules of the problem.
- Here in CSP we represent each problem with a set of components namely V, D, and C. where,
  V: It is a set of variables.
  D: It is a set of domains.
  C: It is a set of constraints.
- The constraint value is a pair of (scope, rel). Where scope is a tuple of variables which participate in constraint and rel is relation which includes a list of values which the variables can take to satisfy the constraints.
- For example, if we take the n-Queen problem, the local condition is that no two queens attack each other, i.e., no two queens should be in the same row, or column, or diagonal.
- We can solve the problem by satisfying the local conditions.
- Some other real-life example problems for constraint satisfaction are sudoku games, map coloring/graph coloring problems, cryptarithmetic problems in which we use the csp method etc.

(iii)Objective:

In this project, we allocate faculty with a set of subjects to different sections based on their preferences/interests, availability etc. by using constraint satisfaction problem.

(iv) Contribution:

AP20110010074 – implementation of code

AP20110010081 – ppt and collection of datasets

AP20110010112 – project report

AP20110010120 – implementation of code

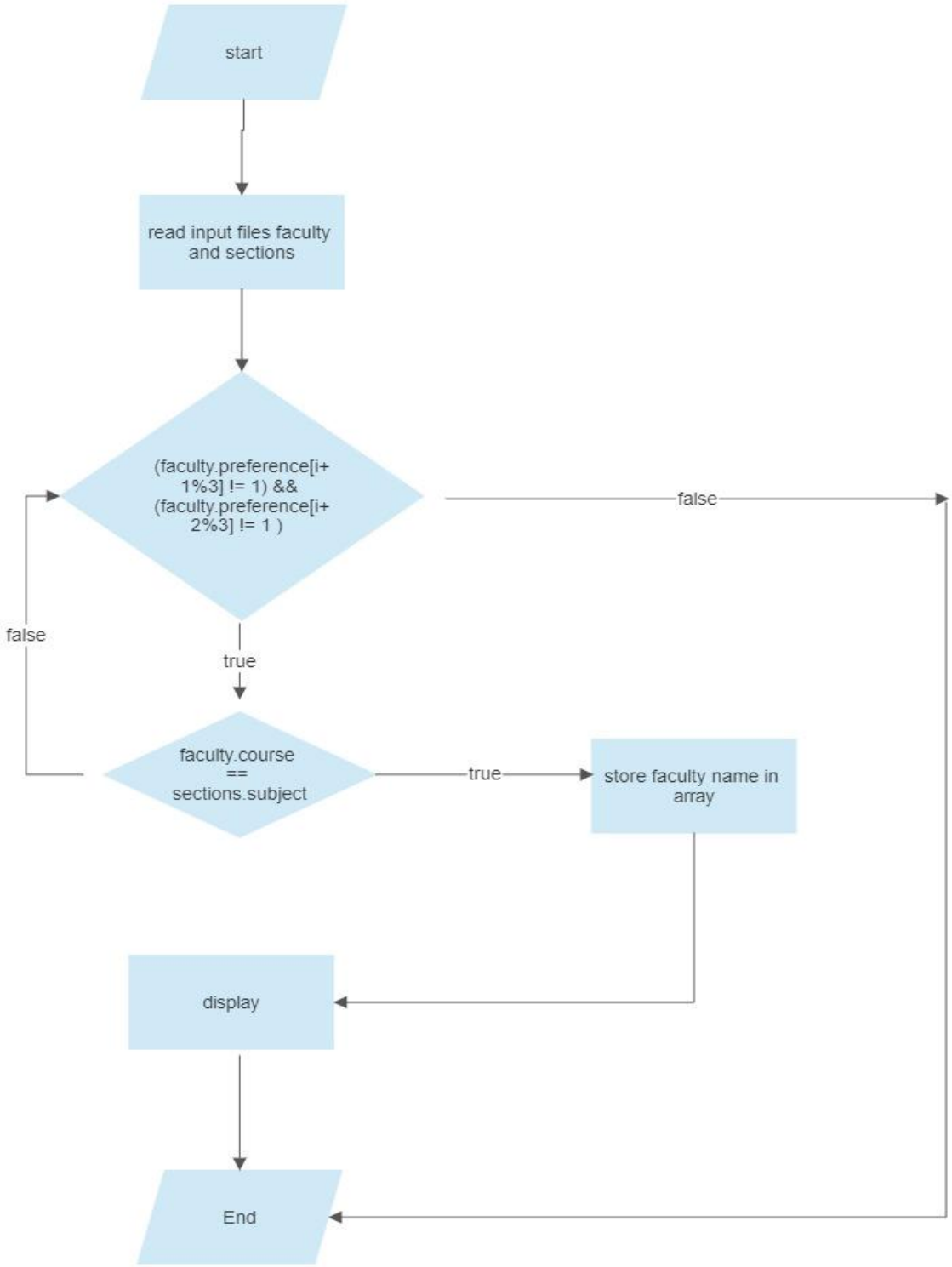
AP20110010122 – project report and collection of datasets

Technical Specifications:

(i)Proposed Model:

- Choose two databases: faculty and sections
- Choose sections database and select the subjects one by one.
- In faculty database, find the faculty having that subject as a first preference.
- If we find any faculty with first preference, we allocate that subject to the faculty.
- Else, we search for the faculty having that subject as a second preference.
- We follow each and every allocation based on constraints.

(ii)Flow chart:



(iii)Constraints:

- Faculty should not go for two subjects for the same section.
- Total number of sections a faculty can go for teaching must be less than three.
- Subject allocation should be done based on the preferences. i.e., first preference subject should be allocated first.
- Each section should have atmost five to six subjects.

(iv)Performance evaluation:

- All the subjects must be allocated to the faculties must satisfy the constraints.
- For every section, faculty must be assigned to every subject. No section should left idle without faculty.

From the above parameters we calculate the performance.

Simulation result:

(i)Inputs:

Here we take 2 databases as input one is sections and other is faculty. Where sections database contains a semester number, followed by branch with section, followed by subjects. And faculty database contains faculty names followed by their three subject preferences.

Faculty database:

Attributes: faculty name and their preferences

Sections database:

Attributes: sem, sections, subjects

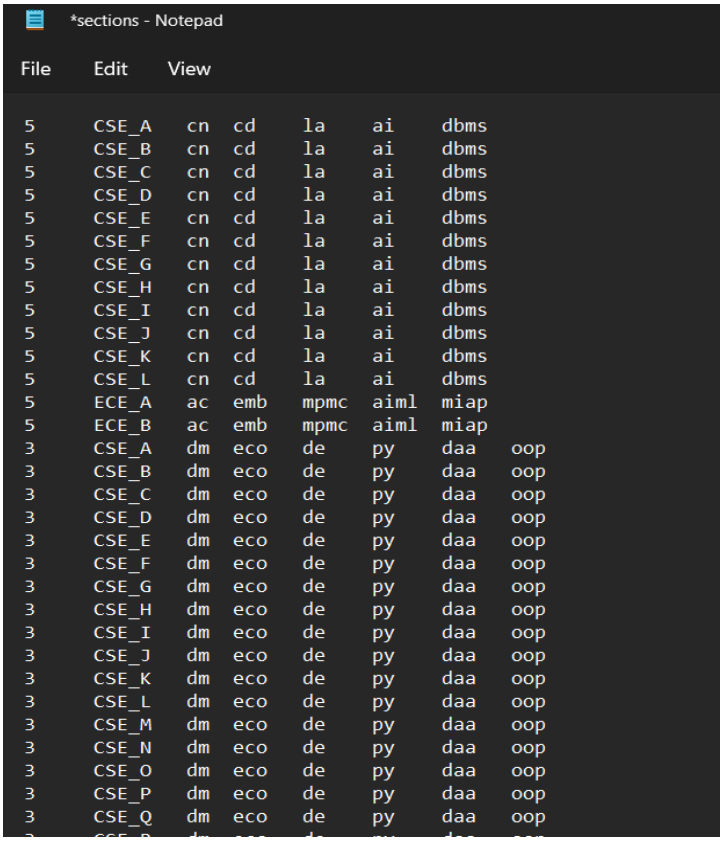


Fig: subject database

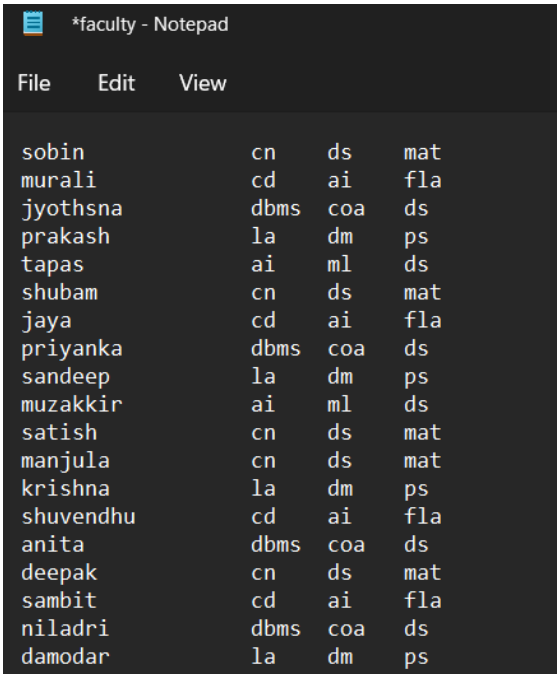


Fig: faculty database

(ii)Output:

The output will be subject name followed by allocated faculty for that subject for each section.

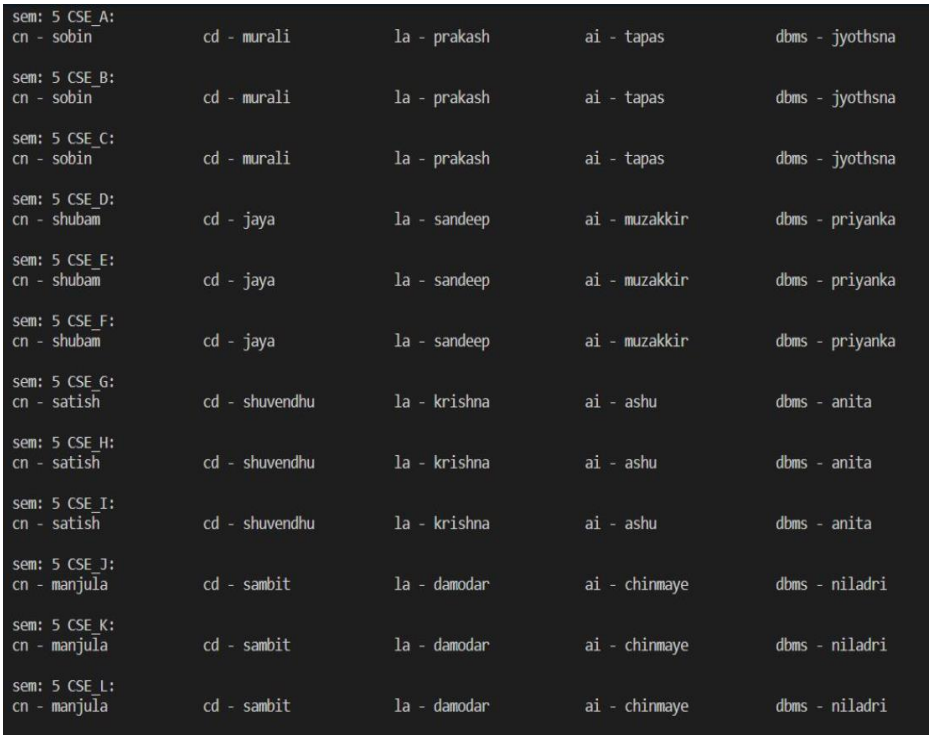


Fig: Final output

Conclusion:

Now a days many institutes are doing physical or manual work for allocating subjects to faculty which takes long time to assign and a heavy load to the person who is doing it. There may be chances of making errors frequently. So, here we came up with the method mentioned above to overcome the problems faced during allocating the subjects to faculty which makes it easier to the institutes to make the work faster and reducing the chances of errors.

Future improvement:

Adding more constraints like: If we cannot find faculty for any subject, then allocating that subject for the faculty having similar interests, then the system may be more efficient.