



**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, cryptarithmic 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

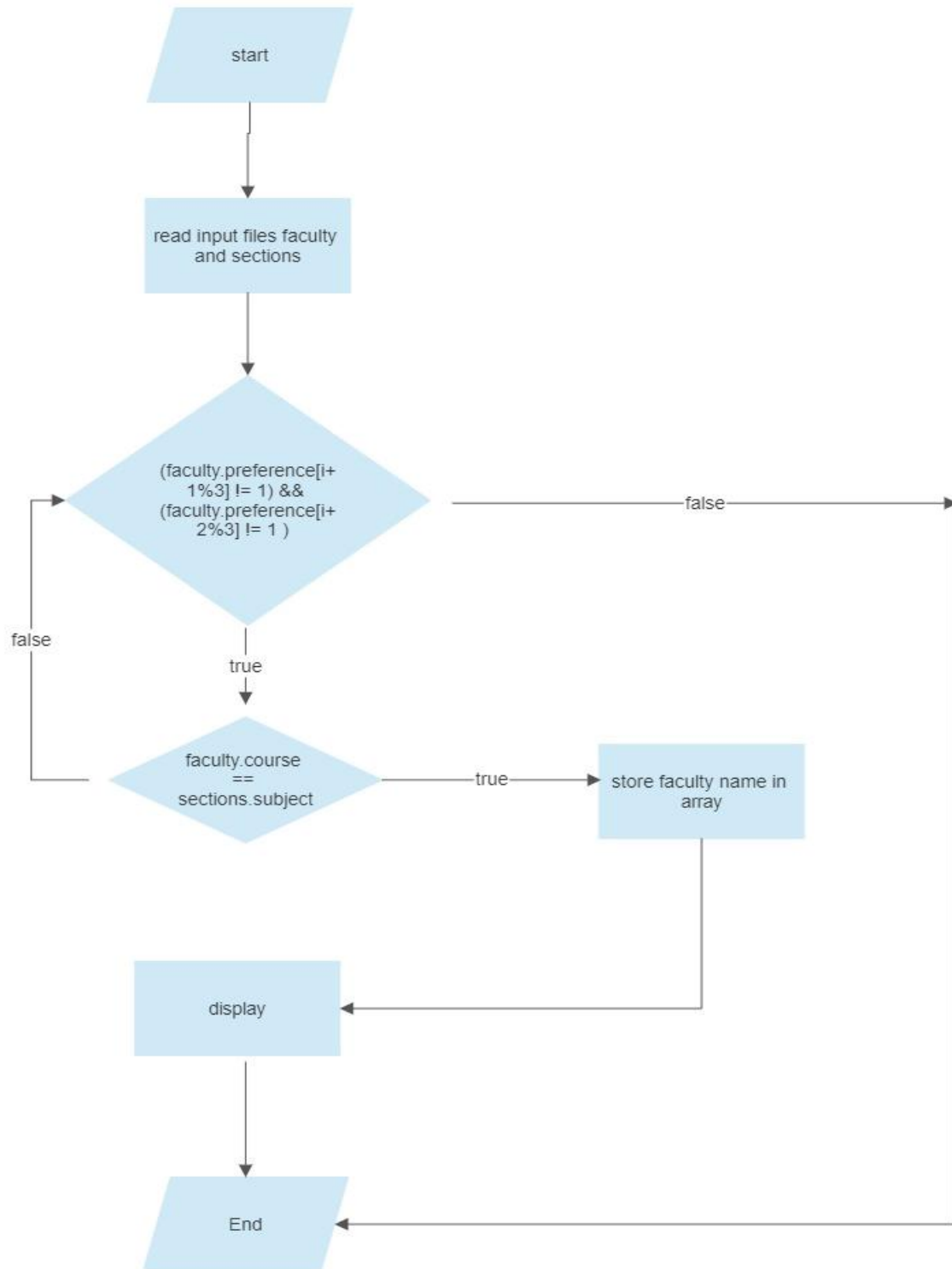
AP20110010120 – implementation of code

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

*sections - Notepad

File	Edit	View					
5	CSE_A	cn	cd	la	ai	dbms	
5	CSE_B	cn	cd	la	ai	dbms	
5	CSE_C	cn	cd	la	ai	dbms	
5	CSE_D	cn	cd	la	ai	dbms	
5	CSE_E	cn	cd	la	ai	dbms	
5	CSE_F	cn	cd	la	ai	dbms	
5	CSE_G	cn	cd	la	ai	dbms	
5	CSE_H	cn	cd	la	ai	dbms	
5	CSE_I	cn	cd	la	ai	dbms	
5	CSE_J	cn	cd	la	ai	dbms	
5	CSE_K	cn	cd	la	ai	dbms	
5	CSE_L	cn	cd	la	ai	dbms	
5	ECE_A	ac	emb	mpmc	aiml	miap	
5	ECE_B	ac	emb	mpmc	aiml	miap	
3	CSE_A	dm	eco	de	py	daa	oop
3	CSE_B	dm	eco	de	py	daa	oop
3	CSE_C	dm	eco	de	py	daa	oop
3	CSE_D	dm	eco	de	py	daa	oop
3	CSE_E	dm	eco	de	py	daa	oop
3	CSE_F	dm	eco	de	py	daa	oop
3	CSE_G	dm	eco	de	py	daa	oop
3	CSE_H	dm	eco	de	py	daa	oop
3	CSE_I	dm	eco	de	py	daa	oop
3	CSE_J	dm	eco	de	py	daa	oop
3	CSE_K	dm	eco	de	py	daa	oop
3	CSE_L	dm	eco	de	py	daa	oop
3	CSE_M	dm	eco	de	py	daa	oop
3	CSE_N	dm	eco	de	py	daa	oop
3	CSE_O	dm	eco	de	py	daa	oop
3	CSE_P	dm	eco	de	py	daa	oop
3	CSE_Q	dm	eco	de	py	daa	oop

Fig: subject database

*faculty - Notepad

File	Edit	View			
sobin		cn	ds	mat	
murali		cd	ai	fla	
jyothsna		dbms	coa	ds	
prakash		la	dm	ps	
tapas		ai	ml	ds	
shubam		cn	ds	mat	
jaya		cd	ai	fla	
priyanka		dbms	coa	ds	
sandeep		la	dm	ps	
muzakkir		ai	ml	ds	
satish		cn	ds	mat	
manjula		cn	ds	mat	
krishna		la	dm	ps	
shuvendhu		cd	ai	fla	
anita		dbms	coa	ds	
deepak		cn	ds	mat	
sambit		cd	ai	fla	
niladri		dbms	coa	ds	
damodar		la	dm	ps	

Fig: faculty database

(ii)Output:

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

sem: 5 CSE_A: cn - sobin	cd - murali	la - prakash	ai - tapas	dbms - jyothsna
sem: 5 CSE_B: cn - sobin	cd - murali	la - prakash	ai - tapas	dbms - jyothsna
sem: 5 CSE_C: cn - sobin	cd - murali	la - prakash	ai - tapas	dbms - jyothsna
sem: 5 CSE_D: cn - shubam	cd - jaya	la - sandeep	ai - muzakkir	dbms - priyanka
sem: 5 CSE_E: cn - shubam	cd - jaya	la - sandeep	ai - muzakkir	dbms - priyanka
sem: 5 CSE_F: cn - shubam	cd - jaya	la - sandeep	ai - muzakkir	dbms - priyanka
sem: 5 CSE_G: cn - satish	cd - shuvendhu	la - krishna	ai - ashu	dbms - anita
sem: 5 CSE_H: cn - satish	cd - shuvendhu	la - krishna	ai - ashu	dbms - anita
sem: 5 CSE_I: cn - satish	cd - shuvendhu	la - krishna	ai - ashu	dbms - anita
sem: 5 CSE_J: cn - manjula	cd - sambit	la - damodar	ai - chinmaye	dbms - niladri
sem: 5 CSE_K: cn - manjula	cd - sambit	la - damodar	ai - chinmaye	dbms - niladri
sem: 5 CSE_L: cn - manjula	cd - sambit	la - damodar	ai - chinmaye	dbms - niladri

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.