EVENT SCHEDULING USING CONSTRAIN SATISFACTION APPROACH

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Abstract - *The traditional way which universities are currently following for event scheduling involves manual allocation of faculty per subject. This is very tedious and non-efficient way to opt. In addition to this, the probabilities of occurrence of clashes in the planned schedule are high. In order to resolve such NP-hard problem ,various techniques are used, such as graph coloring ,Genetic algorithm, N-queens, multiple context. But each of this techniques have different constrains, for example. N-queens ,graph coloring can work for limited number of parameters only.*

The proposed system leads to assist university in allotment process and reduces the overhead by eliminating the possible clashes. It is also possible to trace the locations of college and external's home location. At the same time, it also provide the facility to e-mail each faculty about their respective allotted center and date.

Key Words: University timetabling, graph coloring, Genetic Algorithm, Scheduling, Timetable.

1. INTRODUCTION

Event scheduling algorithm states that a set of events that have a start time and finish time, and need to produce a subset of these events such that no events intersect each other (that is, having overlapping times), and that have the maximum number of events scheduled as possible. Event scheduling for exam is considered as NP hard problem hence it can't be solved in the polynomial time domain. It states that such problems do not have best solution, the output always depend on the set of input given, hence it uses heuristic approach for problem solving, leading to good solution, but not the best solution . therefore in order to solve such problem various algorithm that can be used are graph coloring ,Genetic algorithm, N-queens, multiple context. But each of this techniques have different

constrains, for example. N-queens ,graph coloring can work for limited number of parameters only.

The purpose of this proposed system is make a schedule that do not conflict in timing and date of external practical with the same TEACHER to multiple college. For ex. One teacher has allocated as an external for DAA and DBMS practical for two colleges at same date. So this is inconvenient for one to examine all the student of both colleges at the same day.

The proposed system implements the concept of constraint satisfaction. It supports the scheduling process by specifying all the required conditions as soft and hard constrains to achieve the solution of the problem statement. Hard constrains can be defined as those constrains the must be satisfied throughout the problem solving process ,for example. allotting teacher to only slots which are not yet occupied. Soft constrains are those that are required to be satisfied in problem solving as far as possible, for example. Building schedule which is best, and optimized. Another advantage of using constraints satisfaction is "easy modification " that is we can add or remove the various constraints as per required.

2. LITERATURE REVIEW

[1]Anirudha Nanda, Manisha P. Pai, and Abhijeet Gole, The proposed paper introduces the concept of constrain satisfaction algorithm in order to solve the Np-hard problem ,which is Scheduling time table, primarily it supports the scheduling process by specifying all the required conditions as soft and hard constrains, availability of resources like teachers ,etc to achieve the solution of the problem statement. Hard constrains can be teacher to only slots which are not yet occupied. Soft constrains are those that are required to be satisfied in problem solving as far as possible, for example. Building schedule which is best, and optimized.defined as those constrains the must be satisfied throughout the problem solving process ,for example: allotting

[2] Baki Koyuncu ,Mahmut Seçir Ankara, The proposed paper implements the concept of graph coloring in order to solve the scheduling problem, it also states that as it is NP hard, it can't be solved in the polynomial time domain. it applies graph coloring to eliminate the conflicts in association between different subjects while scheduling and finally leads to reduce the number of collision .These are intelligently-ordered and intelligently-searched sequential coloring methods and constraint programming formulations of graph coloring in solving such problems.

[3] Anirudha Nanda, Manisha P. Pai, and Abhijeet Gole,this paper introduces the timetable scheduling problem with its solution implementing heuristic approach, it states that such problems do not have best solution, the output always depend on the set of input given, hence it uses heuristic approach for problem solving leading to good solution, but not the best solution .Due to the combinatorial explosive nature of the problem, enumeration and other deterministic methods fail and heuristics is preferred.

3. PROPOSED PLAN

The main motive is to implement constrains for fulfilling vital conditions ,which could develop an algorithm that produces the web based schedule for external examiner allotment . The proposed system takes input as Teachers database, College database and Subject database from the Admin. This platform access three different databases, which are teacher , college and subject.

Teacher's database attributes : teacher_id , teacher_name, college_name, internal_date.
College database attributes : college_id, college_name, college_code.
Subject database attributes : semester,subject_id, branch_code, branch_name, subject_name.
The project is mainly divided into modules given below.

INPUT:
In this module the parameter such as ALLOT_COLLAGE , ALLOT_SUBJECT , ALLOT_DATE are taken from Admin.

OUTPUT :
This gives output as the tabular format schedule having collage name , allotted collage , external examiner , external date and subject of particular collage.

CONSTRAIN SATISFACTION:
It is a module where all the data from INPUT module and knowledge base(Database) is used to generate a legitimate schedule.

VERIFICATION :
In this module the list of possible teacher generated from CONSTRAIN SATISFACTION module is verified, plus all the required conditions are checked , such as
Availability of teacher for allotment. Already allotted date ,if any.
After satisfying all the constrains , modification in allotment table(reference table) can also be done here.

TIME-TABLE GENERATOR:
This module associate all the required detail such as allotted college ,allotted subject ,allotted date with the selected faculty and final entry is made into the database.

TIME-TABLE E-MAIL GENERATOR:
This module makes use of Google Gmail service and send an alert to the examiners ,containing all the required detail such as allotted date ,allotted college, allotted subject.

This proposed system ensures the following features .
- Easy slot assignment.
- Minimum time consumption.
- No clashes.
- Reduced overhead on teachers ,by allotting them _accordingly.
- Various slot combinations can be acquired
- User-friendly
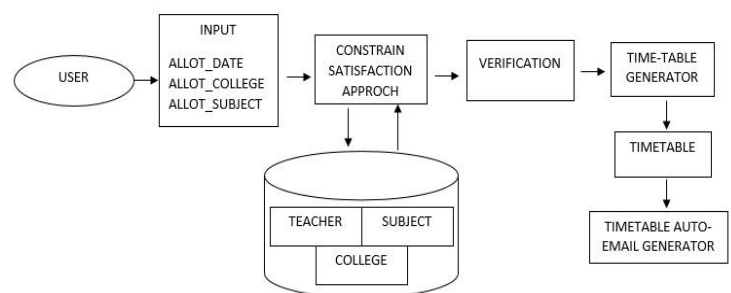
USER(ADMIN) : User login into the system and information related to subject , teacher and collage is given as input .

PROCEDURE:

Algorithm_Schedule_Generator
(COLLEGE_ALLOTE,SUBJECT_ALLOTE,DATE_ALLOTE,SEMESTER)

1. Resultset <- Read()
2. Temp <- allotement()
3. Temp.assign()
4. End of algorithm
   Read()
   1. Initialize i
   2. for i <- 1 to n
   3. IF(college_name!= COLLEGE_ALLOTED and subject = SUBJECT_ALLOTED and internal_date != DATE_ALLOTED)
   4. THEN
   Return teacher/t
   Allotement()
   1. Init i
   2. for i <- 1 to n
   3. IF(t € Allotement_table)
   4. THEN
      4.1 IF(t.internal_date= DATE_ALLOTED)
      4.2 THEN
         $t_x = t_{x+1}$

      4.3 ELSE
         Return t
   5. ELSE
      Return t
   Assign()
   1. t.Alloted_college = COLLEGE_ALLOTED
   2. t.Alloted_subject = SUBJECT_ALLOTED
   3. t.Alloted_date = DATE.ALLOTED

Explanation:

Algorithm_Schedule_Generator takes 4 parameters:
COLLEGE_ALLOTE -College name selected for allotment.
SUBJECT_ALLOTE-Subject name to be allotted .
ALLOTE_DATE-Date which is to be allotted.
SEMESTER- Semester (ex. schedule for 1st sem)
After checking set of constrains Read function will return a set of available teacher ,who can be used for further schedule allotment process.
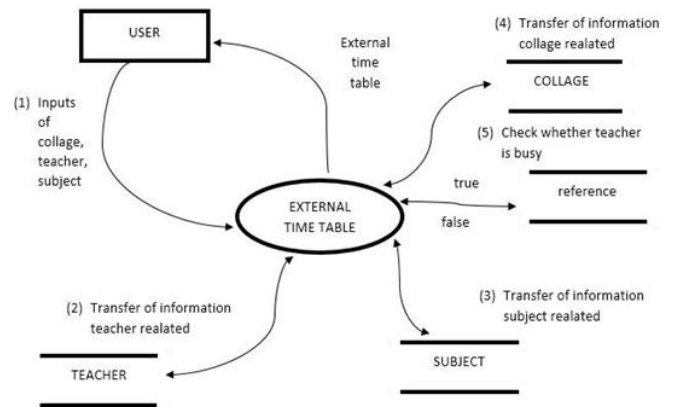Resultset ={$t_1,t_2....t_n$}

Allotment function:
It refers the Allotment table to check whether the selected teacher is already allotted to various college or not.

Assign function:
After satisfying the constrains specified in Read and Allotment function ,the selected teacher will be allotted to respected college and subject on specified date.

DATA FLOW DIAGRAM.

- The Admin login into the system, by entering the username and password , which is then send to the database for authentication.
- Once authentication is done ,the Admin enters information related to available collage , teacher and subjects .
- Then Admin enters the parameters that are ALLOT_COLLEGE,ALLOT_SUBJECT,ALLOT_DATE.
- Once the information is available it is checked with the database to find the set of available teachers that can be allotted.
- And make changes into the reference table ,accordingly.
- If the selected lecturer is already allotted then iterations are made to find the available lecturer for further allotment process.
- After successful allotment of teachers and subjects to different colleges ,the final schedule will be generated in tabular format.
- Provisions are also made to automatically send an alert (ie. email)to all the allotted faculty in context to the schedule.

4.CONCLUSION

The proposed system will generate the schedule that do not conflict in timing and date of external practical with

the same TEACHER to multiple college .In addition ,it uses Google Gmail service to send an electronic mail containing all the required information about the scheduled allotment .The project reduces time consumption and the overhead in framing the timetable manually.

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