

## **UCS2201 Fundamentals and Practice of Software Development**

### **Project on Timetable Management System – End Semester Review**

#### **Timetable Management System for an Academic Institution**

- A Report

#### **Presented By:**

P A Manickam – 3122 21 5001 049

R Nikhilesh – 3122 21 5001 060

Jaanus Sri K G – 3122 21 5001 037

**On 26-08-2022.**

#### **Table of contents**

1. Abstract
2. Introduction
3. Existing work
4. Design(Architecture diagram,  
module design)
5. Implementation and results
6. Conclusion
7. References

## **ABSTRACT :**



University timetable construction is hardworking and complicated task when there are large number of course arrays and limited resources. As a result, universities and some institutes tend to solve this issue manually even; the result may not always optimal. In this paper, we discuss about a framework of utilizing timetable management system to the schools and universities for resource optimization. To formulate a simple and effective solution for academic institutions which ensures a systematic working of the institution by generating a timetable. The methodology used in solving the problem in this research work is c programming language and files to store the generated timetable. By using **Brute force** method we made it possible to generate timetable for an academic institution by giving properly designed inputs(sensitive). Our endeavor through the overall research was to develop a timetable management system to overcome scheduling issues like course clashes, insufficient lab resources and hall facilities.

## **INTRODUCTION:**

Constructing error free timetable is a strenuous and complex task for academic institutes such as universities. Management of almost every schools and colleges have to handle three types of resources: students, teachers, rooms. Upper regulations defines which students should be taught what subject and how much time should be used to do so, which means each student has a set of courses to be provided for them. Beside students every courses also needs one teacher and a room to take place. It is impossible for courses to share a teacher or a room. Additionally it is highly unlikely for a teacher to be able to conduct all types of courses.

The problem how to assign schedules for each class students, teachers and room is called the academic timetable scheduling problem. In literature a simplified problem, where no rooms are taken into account during scheduling are called class teacher timetable problem. There are diversity of education systems. Changes usually affects the way that schedules are evaluated and compared. It is even possible that in one country a schedule may be concerned unfeasible while in other it would be a very good one.

Sometimes changes are even bigger, some countries use the idea of compulsory and optional subjects while in others all subject should be attended to. The other very important difference affects the concept of student groups. Students are the most numerous resource type that school needs to maintain. To simplify this task, students with the similar educational needs are grouped. Such a collections of students are called classes. In some countries, students in one class should have identical schedule, that means there is no possibility to split class members across different lessons. Although in majority of countries, classes are more flexible, there may be possibility to split members across two different lessons or event allocate the students freely between the different ones.

## **EXISTING WORK:**

Current timetable management system with **graph coloring heuristic technique** is efficient enough to carry out the courses without clashes manually. Nevertheless, problems occur due to insufficient resources.

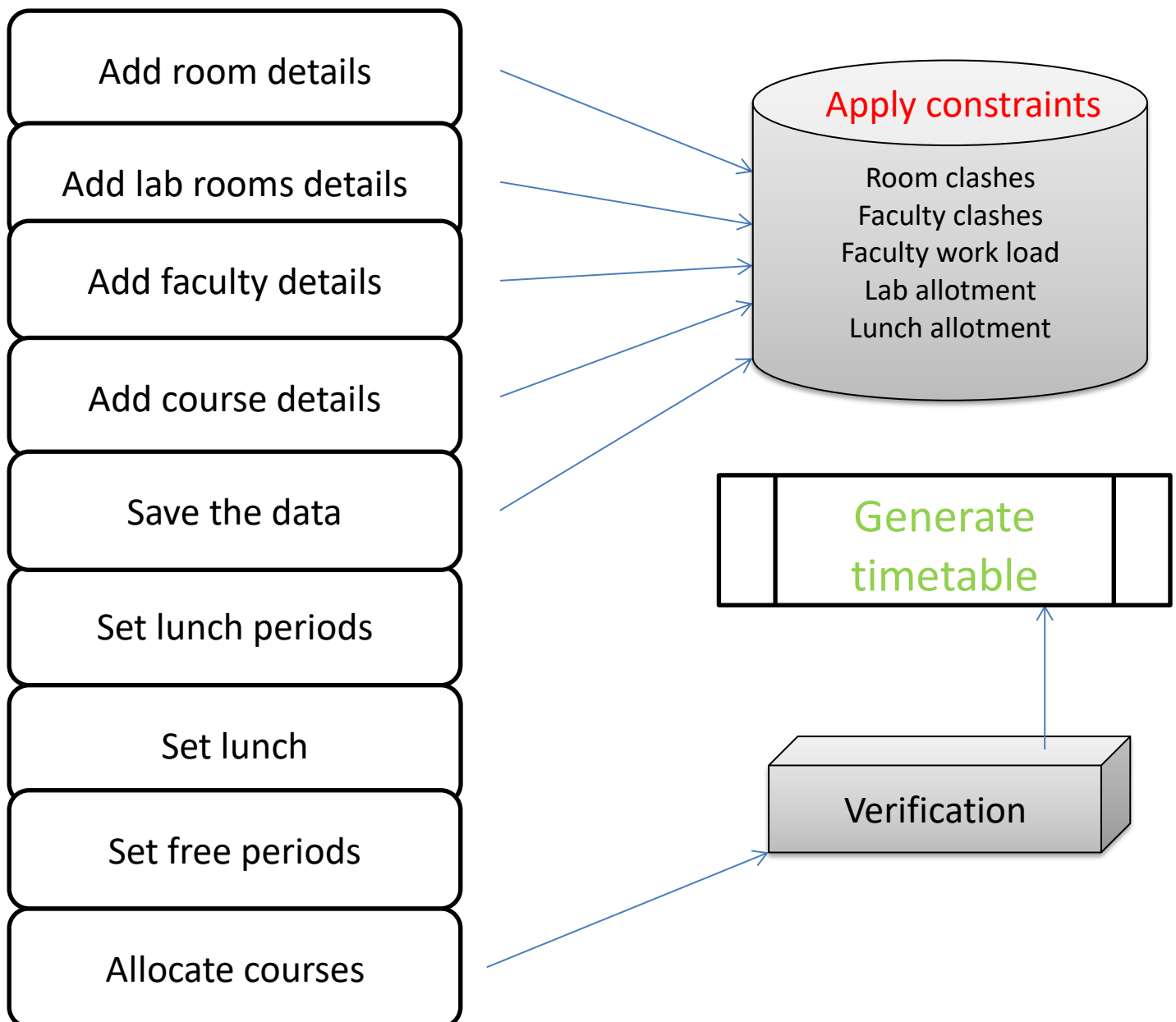
**Simulated annealing** is a local- search meta- heuristics that takes inspiration from annealing in metallurgy. The annealing is a process of heating and controlled cooling of a material to improve its quality.

**Tabu search** is another type of local-search meta heuristic. It improves the standard local search to reduce the chance of being stuck in a local optimum. Unlike simulated annealing, tabu search does not use probability so extensively. It evaluates every solution neighborhood and always picks the best one.

**Genetic algorithms** are inspired by the way that nature searches for better solutions. The algorithm maintains the population that is relatively large set of feasible solutions and introduces an iterative evolution process. In each step the whole population is changed in such a way that tries to simulate the real life generations.

## DESIGN:

Design before coding is very much important and it also considered to be a best practice. Before start to code designing the algorithm is essential. That reduces the time on implementation and pull away from lot of errors. This design is very clear to understand the timetable scheduling solution. Getting all the inputs from the user and make an efficient timetable.



## IMPLEMENTATION AND RESULTS:

This program is inputs sensitive. If you give wrong inputs then you will not get a proper timetable and have to give the inputs again from the first. So give inputs with your proper knowledge.

This approach assumes very deep recursion process.

i) Enter the proper numeric inputs asked:

ABLE PROJECT\IRONY\_ClassTT.exe

```

***** :: WELCOME TO TIMETABLE GENERATION SYSTEM :: *****

Enter total days           : 5
Enter no. of lectures per day(inc.lunch): 5
Enter total no. of classes : 2
Enter total no. of faculties : 15
Enter total no. of classrooms : 2
Enter total no. of labrooms  : 2

```

ii) Enter the proper classroom names and lab room names:

D:\TIME TABLE PROJECT\IRONY\_ClassTT.exe

```

Enter room name 1 : 001

Enter room name 2 : 002

Enter labroom 1 name: Mechanicallab

Enter labroom 2 name: Programminglab

```

iii) Enter the staff names

D:\TIME TABLE PROJECT\IRONY\_ClassTT.exe

Enter teacher name 1: DR.ASF

Enter teacher name 2: DR.KR

Enter teacher name 3: DR.NP

Enter teacher name 4: PROF.KSR

Enter teacher name 5: DR.BHL

Enter teacher name 6: PROF.KSG

Enter teacher name 7: DR.KGL

Enter teacher name 8: DR.DFS

Enter teacher name 9: DR.HB

Enter teacher name 10: PROF.MCL

Enter teacher name 11: DR.BEL

Enter teacher name 12: DR.MNP

Enter teacher name 13: DR.CCD

Enter teacher name 14: DR.ELA

Enter teacher name 15: PROF.BSK

iv) Enter course details

Enter course 1 name : CSE

D:\TIME TABLE PROJECT\IRONY\_ClassTT.exe

— □ ×

CSE

Enter total theory subjects: 5

Enter no. of lab courses : 2

Enter lab course 1 name : mechpractice

Enter a room for this lab course 1:

Room 0 Mechanicallab:

Room 1 Programminglab:

0

Select a teacher for this lab course 1:

0.DR.ASF

1.DR.KR

2.DR.NP

3.PROF.KSR

4.DR.BHL

5.PROF.KSG

6.DR.KGL

7.DR.DFS

8.DR.HB

9.PROF.MCL

10.DR.BEL

11.DR.MNP

12.DR.CCD

13.DR.ELA

14.PROF.BSK

0

Enter lab course 2 name : FPSDprogramming

Enter a room for this lab course 2:

Room 0 Mechanicallab:

Room 1 Programminglab:

1

Select a teacher for this lab course 2:

0.DR.ASF

1.DR.KR

2.DR.NP

3.PROF.KSR

4.DR.BHL

5.PROF.KSG

6.DR.KGL

7.DR.DFS

8.DR.HB

9.PROF.MCL

10.DR.BEL

11.DR.MNP

12.DR.CCD

13.DR.ELA

14.PROF.BSK

1



Enter subject name: FPSD  
Enter subject credit: 3  
Select a teacher for subject 1:

- 0.DR.ASF
  - 1.DR.KR
  - 2.DR.NP
  - 3.PROF.KSR
  - 4.DR.BHL
  - 5.PROF.KSG
  - 6.DR.KGL
  - 7.DR.DFS
  - 8.DR.HB
  - 9.PROF.MCL
  - 10.DR.BEL
  - 11.DR.MNP
  - 12.DR.CCD
  - 13.DR.ELA
  - 14.PROF.BSK
- 1

Enter subject name: Maths  
Enter subject credit: 3  
Select a teacher for subject 2:

- 0.DR.ASF
  - 1.DR.KR
  - 2.DR.NP
  - 3.PROF.KSR
  - 4.DR.BHL
  - 5.PROF.KSG
  - 6.DR.KGL
  - 7.DR.DFS
  - 8.DR.HB
  - 9.PROF.MCL
  - 10.DR.BEL
  - 11.DR.MNP
  - 12.DR.CCD
  - 13.DR.ELA
  - 14.PROF.BSK
- 2

Enter subject name: BEEE  
Enter subject credit: 2  
Select a teacher for subject 3:

- 0.DR.ASF
  - 1.DR.KR
  - 2.DR.NP
  - 3.PROF.KSR
  - 4.DR.BHL
  - 5.PROF.KSG
  - 6.DR.KGL
  - 7.DR.DFS
  - 8.DR.HB
  - 9.PROF.MCL
  - 10.DR.BEL
  - 11.DR.MNP
  - 12.DR.CCD
  - 13.DR.ELA
  - 14.PROF.BSK
- 3

Enter subject name: evs  
Enter subject credit: 2  
Select a teacher for subject 4:

- 0.DR.ASF
  - 1.DR.KR
  - 2.DR.NP
  - 3.PROF.KSR
  - 4.DR.BHL
  - 5.PROF.KSG
  - 6.DR.KGL
  - 7.DR.DFS
  - 8.DR.HB
  - 9.PROF.MCL
  - 10.DR.BEL
  - 11.DR.MNP
  - 12.DR.CCD
  - 13.DR.ELA
  - 14.PROF.BSK
- 4

Enter subject name: Fds  
Enter subject credit: 2  
Select a teacher for subject 5:

0.DR.ASF  
1.DR.KR  
2.DR.NP  
3.PROF.KSR  
4.DR.BHL  
5.PROF.KSG  
6.DR.KGL  
7.DR.DFS  
8.DR.HB  
9.PROF.MCL  
10.DR.BEL  
11.DR.MNP  
12.DR.CCD  
13.DR.ELA  
14.PROF.BSK  
5

v) Allot room for the course


Enter a room for this course

Room 0 001:  
Room 1 002:

0

vi) Enter course details

```
Enter course 2 name : EEE_
```

 D:\TIME TABLE PROJECT\IRONY\_ClassTT.exe

```
Enter no. of labcourses : 1
```

```
Enter lab course 1 name : mechpractice
```

```
Enter a room for this lab course 1:
```

```
Room 0 Mechanicallab:
```

```
Room 1 Programminglab:
```

```
0
```

```
Select a teacher for this lab course 1:
```

```
0.DR.ASF
```

```
1.DR.KR
```

```
2.DR.NP
```

```
3.PROF.KSR
```

```
4.DR.BHL
```

```
5.PROF.KSG
```

```
6.DR.KGL
```

```
7.DR.DFS
```

```
8.DR.HB
```

```
9.PROF.MCL
```

```
10.DR.BEL
```

```
11.DR.MNP
```

```
12.DR.CCD
```

```
13.DR.ELA
```

```
14.PROF.BSK
```

```
0
```

Enter subject name: Maths  
Enter subject credit: 3  
Select a teacher for subject 1:

- 0.DR.ASF
- 1.DR.KR
- 2.DR.NP
- 3.PROF.KSR
- 4.DR.BHL
- 5.PROF.KSG
- 6.DR.KGL
- 7.DR.DFS
- 8.DR.HB
- 9.PROF.MCL
- 10.DR.BEL
- 11.DR.MNP
- 12.DR.CCD
- 13.DR.ELA
- 14.PROF.BSK

6

Enter subject name: evs  
Enter subject credit: 2  
Select a teacher for subject 2:

- 0.DR.ASF
- 1.DR.KR
- 2.DR.NP
- 3.PROF.KSR
- 4.DR.BHL
- 5.PROF.KSG
- 6.DR.KGL
- 7.DR.DFS
- 8.DR.HB
- 9.PROF.MCL
- 10.DR.BEL
- 11.DR.MNP
- 12.DR.CCD
- 13.DR.ELA
- 14.PROF.BSK

3

Enter subject name: Circuits  
Enter subject credit: 3  
Select a teacher for subject 3:

- 0.DR.ASF
- 1.DR.KR
- 2.DR.NP
- 3.PROF.KSR
- 4.DR.BHL
- 5.PROF.KSG
- 6.DR.KGL
- 7.DR.DFS
- 8.DR.HB
- 9.PROF.MCL
- 10.DR.BEL
- 11.DR.MNP
- 12.DR.CCD
- 13.DR.ELA
- 14.PROF.BSK

7

Enter subject name: Mechanics  
Enter subject credit: 2  
Select a teacher for subject 4:

- 0.DR.ASF
- 1.DR.KR
- 2.DR.NP
- 3.PROF.KSR
- 4.DR.BHL
- 5.PROF.KSG
- 6.DR.KGL
- 7.DR.DFS
- 8.DR.HB
- 9.PROF.MCL
- 10.DR.BEL
- 11.DR.MNP
- 12.DR.CCD
- 13.DR.ELA
- 14.PROF.BSK

8

```
Enter subject name: BEEE
Enter subject credit: 3
Select a teacher for subject 5:
```

```
0.DR.ASF
1.DR.KR
2.DR.NP
3.PROF.KSR
4.DR.BHL
5.PROF.KSG
6.DR.KGL
7.DR.DFS
8.DR.HB
9.PROF.MCL
10.DR.BEL
11.DR.MNP
12.DR.CCD
13.DR.ELA
14.PROF.BSK
10
```

vii) Allot room for the course

```
Enter a room for this course
```

```
Room 0 001:
Room 1 002:
```

```
1
```

## OUTPUT:

```
schedule - Notepad

File Edit View

***** :: GENERATED TIMETABLE :: *****

CSE

      day 1      day 2      day 3      day 4      day 5
.....
lecture 1      FPSD      FPSD      FPSD      Maths      Maths
              DR.KR      DR.KR      DR.KR      DR.NP      DR.NP

lecture 2      Maths      BEEE      BEEE      evs      evs
              DR.NP      PROF.KSR  PROF.KSR  DR.BHL  DR.BHL

lecture 3      lunch      lunch      lunch      lunch      lunch

lecture 4      Fds      Fds      library      FPSDprogramming      mechanicalpractice
              PROF.KSG  PROF.KSG  Nill      DR.KR      DR.ASF

lecture 5      library      library      library      FPSDprogramming      mechanicalpractice
              Nill      Nill      Nill      DR.KR      DR.ASF

EEE

      day 1      day 2      day 3      day 4      day 5
.....
lecture 1      Maths      Maths      Maths      evs      evs
              DR.KGL      DR.KGL      DR.KGL      PROF.KSR  PROF.KSR

lecture 2      Circuits      Circuits      Circuits      Mechanics      Mechanics
              DR.DFS      DR.DFS      DR.DFS      DR.HB      DR.HB

lecture 3      lunch      lunch      lunch      lunch      lunch

lecture 4      BEEE      BEEE      BEEE      mechanicalpractice      library
              DR.BEL      DR.BEL      DR.BEL      DR.ASF      Nill

lecture 5      library      library      library      mechanicalpractice      library
              Nill      Nill      Nill      DR.ASF      Nill
```

## **CONCLUSION:**

This method is very useful and efficient to generate timetable in a file. That file can be get saved and printed to use further. Various slot combinations can be acquired so that another timetable is generated as of need. The project reduces the pain in framing timetable manually and also time consumption.

The project is developed in such a way that, no slot clashes occurs providing features to tailor the timetable as of wish.

By making further more and more modifications to we'll definitely make the solution for this problem to get away from the time consumption and to satisfy all the needs of the user for the future enhancement.

## **REFERENCES:**

- ❑ [https://www.academia.edu/6173200/TIMETABLE\\_GENERATION\\_SYSTEM](https://www.academia.edu/6173200/TIMETABLE_GENERATION_SYSTEM)
- ❑ <https://www.educba.com/project-scheduling-techniques/>
- ❑ Timetable\_Management\_System\_Web\_Applicat.pdf
- ❑ <https://www.timetabler.com/newtimetablers/>
- J. J. Moreira, "A system for automatic construction of Exam Timetable using Genetic Algorithms," Rev. Estud. Politécnicos Polytech. Stud. Rev., vol. 6, no. 9, 2008.