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Smart and Dynamic Time Table Generator

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Abstract*: *The manual operation of the timetable preparation in college is very monotonous, time consuming and very difficult process.
Due to its static approach the resource utilization is made ineffective by resulting two or more staff ending up in the same class or single staff is allocated to more than one class which leads to the conflict between the staff. In order to reduce this defect we use genetic algorithm to generate a dynamic timetable. Based on the input details such subjects, batches, staff details, timing details and priority of the subjects a static timetable is generated. And when the presence of the staff is given as an input, then a dynamic timetable is generated in the system.
Keywords: Genetic Algorithm, priority of subjects, dynamic time table.

I. INTRODUCTION

The manual operation of the timetable preparation in college is very monotonous, time consuming and very difficult process. Due to its static approach the resource utilization is made ineffective by resulting two or more staff ending up in the same class or single staff is allocated to more than one class which leads to the conflict between the staff.

In order to reduce this defect we use genetic algorithm to generate a dynamic timetable. The genetic algorithm uses three main operators such as selection, mutation and crossover in order to generate a well-formed dynamic timetable. This algorithm will automatically regenerate, each time of its processing, though there is no changes in the given input. Based on the input details such subjects, batches, staff details, timing details and priority of the subjects a static timetable is generated. And when the presence of the staff is given as an input, then a dynamic timetable is generated in the system.

II. LITERATURE REVIEW

A. Class Teacher problem Implementation

The simulated annealing was chosen by Abramson to solve the timing problem. His implementation always picks the new solution if its quality is better than the current one If the solution is worse, the probability of picking equals:

$$P(Ac)=e(Ac/T)$$

The temperature level is changed after the fixed number of successful swaps. The solution is stored in the set of lesson list.

III.GENETIC ALGORITHM

A genetic algorithm is a metaheuristic inspired by the process of natural selection that belongs to the larger class of evolutionary algorithm. It is commonly used to generate high quality solutions to optimization and search problems. It uses three main operators such as mutation in which is used to get a better solution with mutual probability. Then selection process which is used to sort the given details based on the specified constraints. Then crossover it is used to combine the genetic information to generate a new optimized solution.

IV.WORK OF GENETIC ALGORITHM

Genetic algorithm is a search heuristic algorithm. This algorithm begins by creating a random initial population. The standard procedure is, “if you meet this condition, act like that”. However, no matter how much of work you pour into this method, the final solution will never be able to outsmart its creator.

To avoid this, a new idea called Genetic Algorithms was developed. Before learning what Genetic Algorithm is, let us first understand the theory behind it, the theory of natural selection by Darwin. The theory is simple: If a population want to thrive, it must improve by itself constantly, it’s the survival of the fittest. The best element of the population should inspire the offspring, but the other individuals must not be forgotten in order

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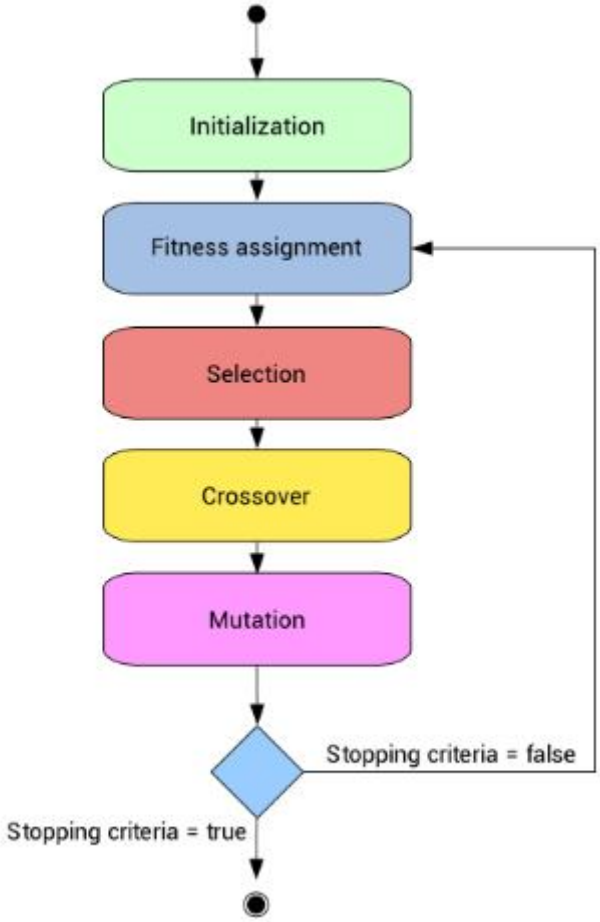

Fig 1: Genetic Algorithm

A Fitness Score is given to each individual which shows the ability of an individual to "compete". The individual having optimal fitness score (or near optimal) are sought. The genetic algorithm is Robust and provide optimisation over large space state. Unlike traditional AI, they do not break on slight change in input or presence of noise.

V. FEATURES

As documented in the five important issues in the Genetic algorithm are chromosome encoding, fitness evaluation, selection mechanisms, genetic operators and criteria to stop the Genetic algorithm. The Genetic algorithm operates on binary search space as the chromosomes are bit strings. The Genetic algorithm manipulates the finite binary population in similitude of human natural evolution. To begin with, an initial population is created (mostly randomly) and evaluated using a fitness function. For binary chromosome employed in this work, a gene value '1' depicts that the particular feature indexed by the position of the '1'is selected. Otherwise, (i.e if it is '0'), the feature is not selected for chromosomal evaluation. Using the positional index of features indexed by the '1s', the chromosomes are then ranked and based on the rankings, the top n fittest kids (Elitism of size n) are selected to survive to the next generation. The fitness evaluation is done through Algorithm 2. After the elite kids are pushed automatically to the next generation, the remaining kids (individuals) in the current population are allowed to genetically pass through the functionals crossover and mutation to form crossover and mutation kids respectively. The three kids via elite, crossover and mutation then form the new population (new generation). Crossover (a genetic functional) is a combination of two individuals (chromosomes) to form a crossover kids. Mutation operator on the other hand, is used for genetic pertmutation of the genes in each chromosomes through bits flipping depending on the mutation probability. Using the steps in the modus operandi of the Genetic algorithm-based feature selection are explained in this section.

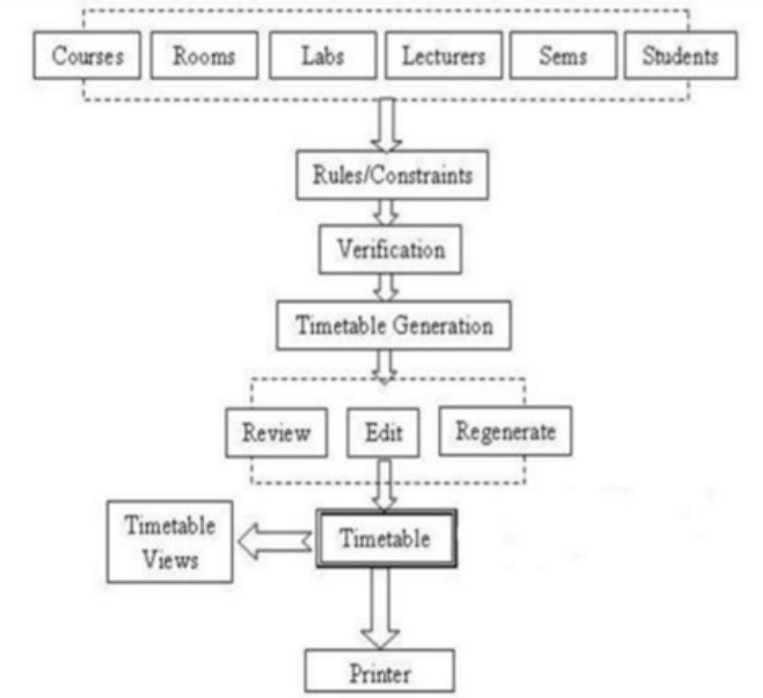

Fig 2 : Block Diagram for automated Timetable generator

VI. REQUIREMENT

The requirement of this system uses JSP for the front end and Java is used for the process of computation, Java Language is Platform Independent means program of java is Easily transferable because after Compilation of java program bytes code will be created then we have to just transfer the Code of Byte Code to another Computer. Java programs are complied to portable intermediate form know as bytecodes, rather than to native machine level instructions and JVM executes Java bytecode on. Any machine on which it is installed. This architecture means that Java programs are faster than program or scripts written in purely interpreted languages but slower than C and C++ programs that compiled to native machine languages.

A. Features

Mysql is a relational database system. If you can believe many diehard MySQL fans, MySQL is faster, more reliable, and cheaper -- or, simply put, better -- than any other database system (including commercial systems such as Oracle and DB2). Many MySQL opponents continue to challenge this viewpoint, going even so far as to assert that MySQL is not even a relational database. MySQL is a client/server system. There is a database server (MySQL) and arbitrarily many clients (application programs), which communicate with the server; that is, they query data, save changes, etc. The clients can run on the same computer as the server or on another computer (communication via a local network or the Internet). MySQL supports as its database language -- as its name suggests – SQL (Structured Query Language). SQL is a standardized language for querying and updating data and for the administration of a database. There are several SQL dialects (about as many as there are database systems). MySQL adheres to the current SQL standard (at the moment SQL:2003), although with significant restrictions and a large number of extensions.

VII. CONCLUSION

As discussed, an evolutionary algorithm, genetics algorithm for time tabling has been proposed. The intention of the algorithm to generate a time-table schedule automatically is satisfied. The algorithm incorporates a number of techniques, aimed to improve the efficiency of the search operation. By automating this process with the help of computer assistance timetable generator can save a lot of precious time of administrators who are involved in creating and managing various timetables of the institutes. Also the timetables generated are much more accurate, precise than the ones created manually. We have used Java along with JSP framework to develop our application. We have used real data of various departments of our institute to test the method and how effectively it is functioning. The project reduces time consumption and the pain in framing the timetable manually. The benefits of this approach are simplified design and reduced development time.

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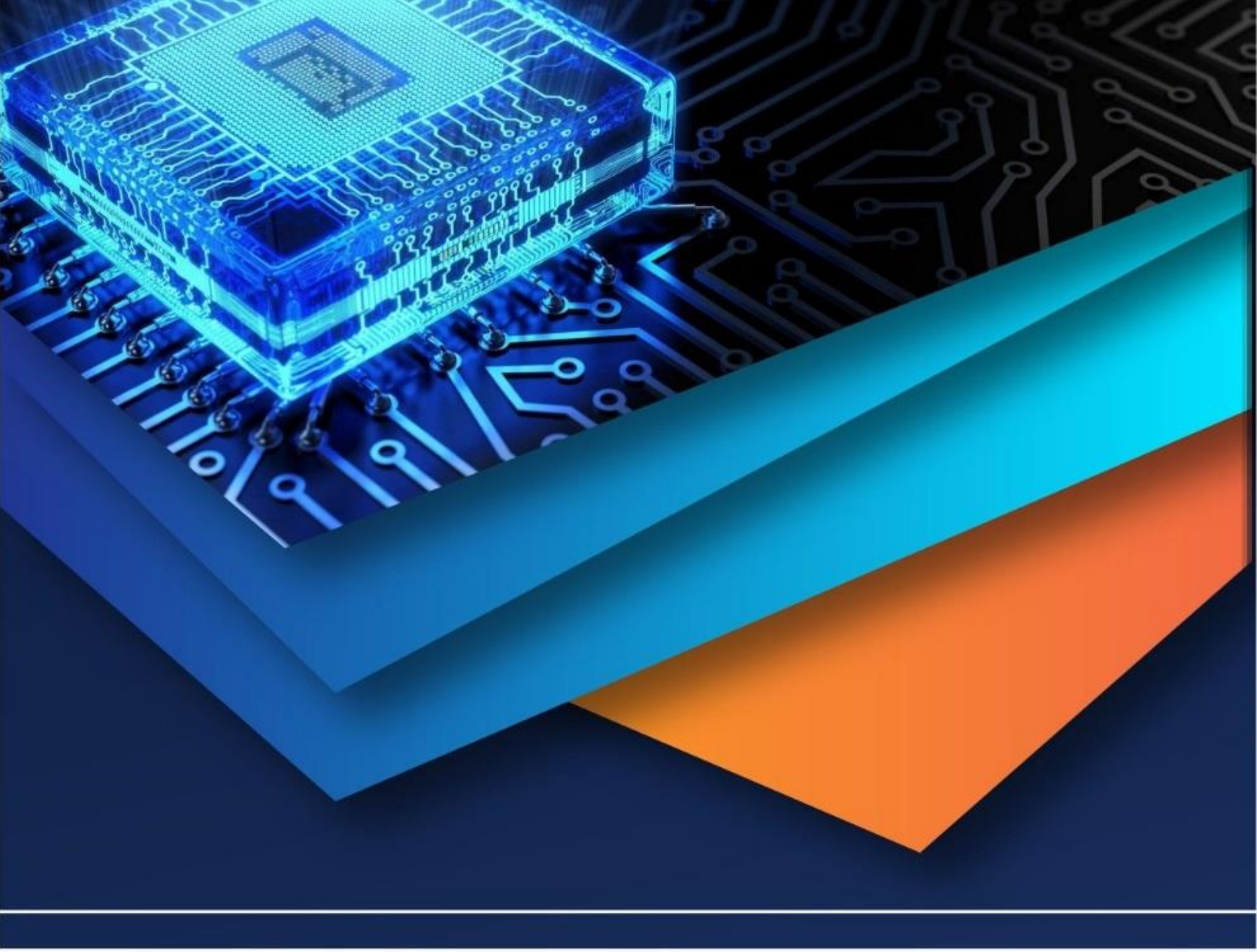

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