GENETIC TIMETABLE: CRAFTING THE PERFECT SCHEDULE

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INTRODUCTION

01

Timetable Generator using Genetic Algorithm project aims to automate the process of timetable generation for schools and universities.

02

Traditional methods are manual and time-consuming.

03

Genetic Algorithm offers an efficient and optimal solution.

04

Objective: Develop a timetable generator using Genetic Algorithm for improved efficiency and effectiveness.

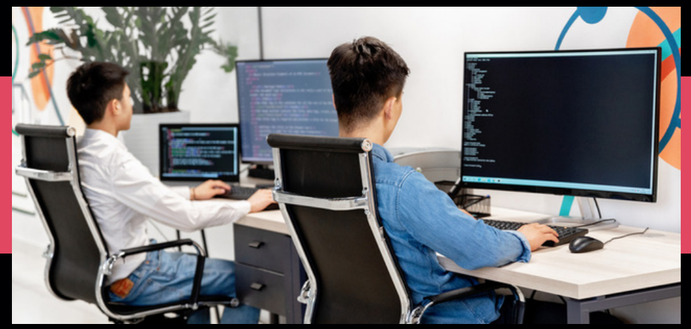
GENETIC ALGORITHMS

- Optimization algorithm inspired by natural selection
- Creates a population of candidate solutions
- Iteratively improves solutions through selection, crossover, and mutation
- Represents candidate solutions as chromosomes with genes representing courses and time slots
- Uses fitness functions to evaluate each chromosome
- Selects the best chromosomes for further breeding
- Aims to converge on an optimal solution that meets constraints and requirements

CONSTRAINTS/REQUIREMENTS

Credit Hour Limit

Restricting the total number of credit hours assigned to the scheduled courses, ensuring they do not exceed a predefined limit and course should have respective classes per week.



Teacher Availability

Ensuring that teachers are available to teach the scheduled courses.

Room Availability

Ensuring that appropriate lecture halls or rooms are available for conducting the scheduled classes and only one section is having a lecture in that specific classroom.

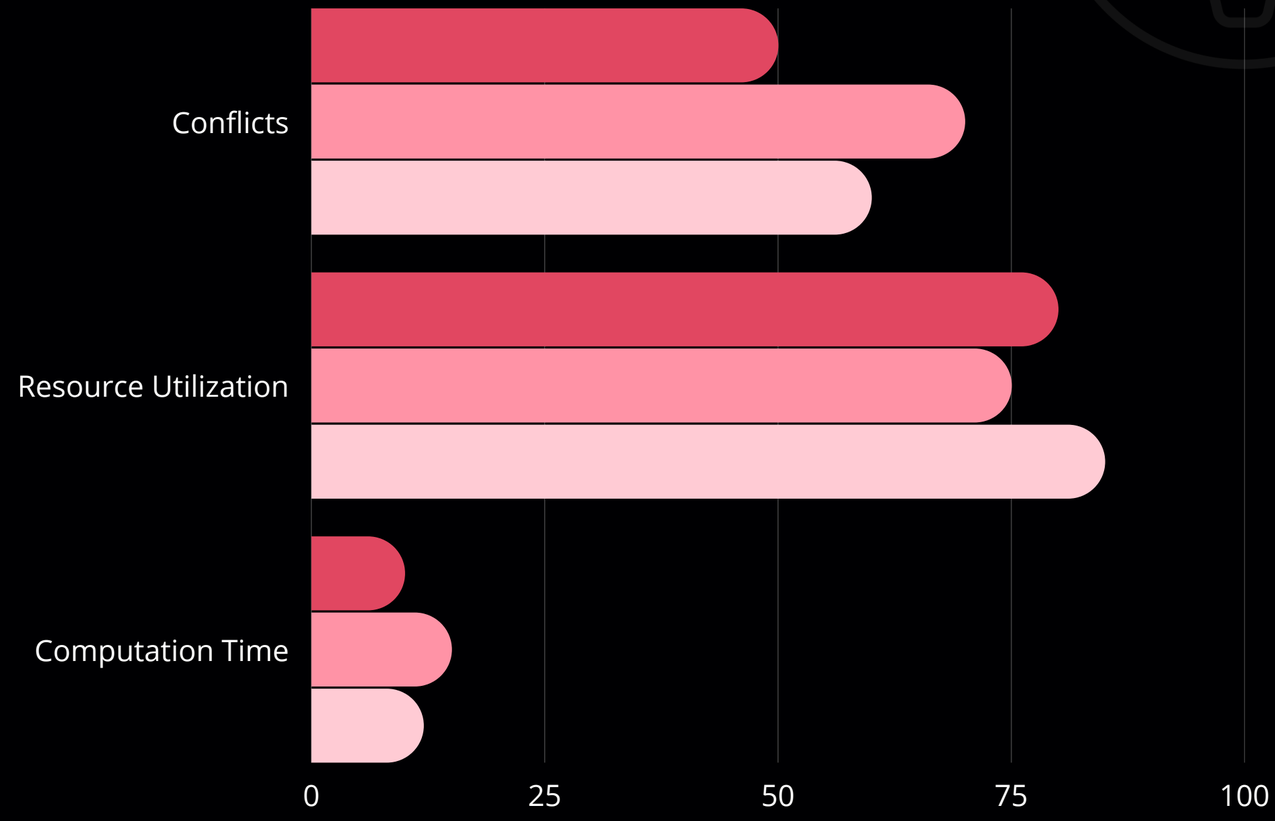
IMPLEMENTATION

- NumPy and Pandas for data manipulation
- Matplotlib for data visualization
- Data input and preprocessing
- Chromosome representation and initialization
- Fitness function evaluation
- Selection
- Crossover
- Mutation

RESULTS AND EVALUATION

Description

- Performance Metrics:
  - Number of conflicts
  - Resource utilization
  - Computation time
- Comparison with Existing Methods:
  - Comparing results with simulated annealing and tabu search
  - Evaluating performance in comparison
- Demonstrating Effectiveness and Efficiency:
  - Showing the effectiveness of the algorithm
  - Showing the efficiency of the algorithm



CONCLUSION

- Timetable Generator using Genetic Algorithm:
  - Promising approach for solving timetable generation in schools and universities
  - Automates the process and generates optimal timetables
  - Meets necessary constraints and requirements
- Project Goals:
  - Demonstrate effectiveness and efficiency of the approach
  - Contribute to the field of optimization algorithms
  - Potential to make a significant impact in the education sector
  - Saves time and resources
  - Improves overall quality of education

> ***Programmers are very important.***


THANK YOU