TimeTable Generator : Link

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Abstract

The Class Schedule Management System is a comprehensive web application designed to streamline the organization and management of class schedules in educational institutions. Leveraging advanced algorithms and intuitive user interfaces, the system facilitates the creation, visualization, and analysis of class schedules for multiple classrooms and subjects.

Time Table Generation

Iteration Over Subjects and Classrooms:

- The algorithm employs a nested loop structure to iterate over each subject and each classroom, ensuring comprehensive coverage of all scheduling possibilities.

- **Within this nested loop:**

- The code calculates the column index for each subject in the timetable using a specific formula `(i + j - 1) % Model.NumberOfSubjects`, where `i` represents the subject index and `j` represents the classroom index. This formula elegantly handles the wrapping around of column indices when they exceed the number of subjects, ensuring a cyclic distribution of subjects across classrooms.

- By retrieving the subject name corresponding to the calculated column index from the `Model.Subjects` collection, the algorithm accurately associates each subject with its respective period in the timetable.

- The retrieved subject name is then appended to the `firstColumnSubjects` list, facilitating subsequent conflict detection and time table generation steps.

Conflict Detection:

- Following the completion of the nested loop, the algorithm analyzes the `firstColumnSubjects` list to identify any scheduling conflicts.

- Utilizing group operations, subjects are grouped by name, enabling efficient filtering of groups with only one subject. This step effectively isolates subjects that are scheduled more than once, indicating potential conflicts.

- The resulting list of conflicted subjects is stored in the `conflicts` list, marking them for further examination and resolution.

Time Table Generation:

- Another loop iteration, this time over the number of classrooms, initiates the process of generating individual time tables for each classroom.

- **Within this loop:**

- HTML markup is dynamically generated for each classroom's timetable, enriching the user interface with informative visuals.

- Each classroom is distinguished by its number, presented prominently as a heading, enhancing clarity and organization.

- A table structure is created to accommodate the specified number of periods, ensuring a comprehensive representation of the classroom's schedule.

- Iterating over each subject in the `Model.Subjects` collection, the algorithm recalculates the column index for each subject using the previously mentioned formula. This recalibration ensures accurate placement of subjects within the timetable grid.

- Subject names are extracted based on the recalculated column index and displayed in respective table cells, providing users with a clear and structured overview of the classroom's schedule.