**Report on the Exam Scheduler Code**

**Overview**

The provided Java program is an implementation of an Exam Scheduler system. It handles the scheduling of exams, ensuring that conflicts between instructors, students, and room availability are avoided. Below is a structured analysis of the key components, functionality, and outputs of the program.

**Key Components**

**1. Classes and Their Responsibilities**

* **Course**:
  + Represents a course with attributes such as courseCode and courseName.
  + Provides getter methods for accessing course information.
* **Room**:
  + Manages room attributes like roomId, capacity, and availability status.
  + Includes methods to check and set room availability.
* **Exam**:
  + Represents an exam instance with attributes such as course, date, duration, room, and instructor.
  + Provides getter methods to access exam details.
* **ExamScheduler**:
  + Core class managing exam scheduling.
  + Handles:
    - Adding rooms.
    - Scheduling exams with constraints like instructor availability, room capacity, and student schedules.
    - Displaying the exam schedule.

**2. Utility**

* The Main class demonstrates the functionality by:
  + Creating instances of rooms and courses.
  + Scheduling multiple exams.
  + Displaying the final exam schedule.

**Functionality**

**1. Scheduling Exams**

The ExamScheduler class provides the scheduleExam method, which checks the following:

* Room capacity and availability.
* Instructor's availability.
* Potential scheduling conflicts for students.  
  If constraints are met, the exam is scheduled; otherwise, a failure message is displayed.

**2. Room Allocation**

The allocateRoom method ensures rooms are allocated based on:

* Required capacity for the class size.
* Availability of the room at the specified time.

**3. Instructor and Student Schedule Management**

* Instructor schedules are tracked to avoid overlaps.
* Although the system has provisions for checking student conflicts (hasStudentConflict), the implementation currently assumes no conflicts.

**4. Schedule Display**

The displaySchedule method outputs all scheduled exams, showing:

* Course name.
* Exam date and time.
* Assigned room.
* Instructor name.

**Example Output**

After running the Main class, the schedule is as follows:

Course: Networking, Date: Sun Dec 15 09:00:00 IST 2024, Room: Room204, Instructor: Dr. Prachi

Course: Data Structures, Date: Sun Dec 15 14:00:00 IST 2024, Room: Room221, Instructor: Dr. Anuradha

Course: Focp, Date: Sun Dec 15 09:00:00 IST 2024, Room: Room231, Instructor: Dr. Garima

**Conclusion**

The Exam Scheduler is a smart tool designed to organize exams efficiently. It considers important factors like room sizes and instructor availability while scheduling. Built with a flexible structure, it can be easily updated or expanded for future needs. Enhancing its ability to handle student conflicts and reallocating rooms dynamically would make it an even more powerful and reliable scheduling solution.

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