Solution Challenge – Timetable Generation

Objective:

Provide solution to develop an automated Timetable Generation System for college that optimally assigns classes to students and teachers while adhering to various constraints and preferences.

The following are the guidelines. You can make your own assumptions or discuss with your department timetable coordinator or mail to CodingClub.

Inputs

- For each class, List of subjects along with number of periods per week for each subject
- Subject allotment – Handling faculty for each subject
- Elective Subjects (Parallel allotment possibility)
- Combined classes if any
- Workload of each faculty
- Classrooms with capacity
- Laboratories with capacity
- TWM, Seminar etc.. may be considered as one subject and included in the workload.

Additional Time Allocation:

- Allocate slot for Tutor Ward Meeting(TWM) and library periods.

Output
- Class Timetable
- Faculty Timetable
- Classroom wise workload
- Lab Timetable

Constraints and Requirements to consider:Staff Schedule:
- Ensure that teachers do not have consecutive teaching hours. Maximum 3 teaching periods per day.
- Lab classes require at least 2 teachers.
- Teacher should have class on all days.

Room and Lab Availability:

- Ensure the availability of classrooms and labs.
- Maximize the utilization of classrooms and labs.
- Only one lab class should be scheduled per day. Unavoidable situation – you can schedule 2.

Class Timing:

- 5 days per week and 7 (4+3) periods per day. In some case you can have 4 periods in the afternoon while scheduling lab classes.

For more clarification, please contact your department Timetable Coordinator.

Explore various concepts like Graph theory, Constraint Satisfaction Problems, AI and ML models, Data structures and algorithms to propose any form of solution that simplifies and optimizes the timetable generation process.