

# University timetable scheduler

**Student:** Aron Fiechter

**Advisor:** Prof. Dr. Michele Lanza

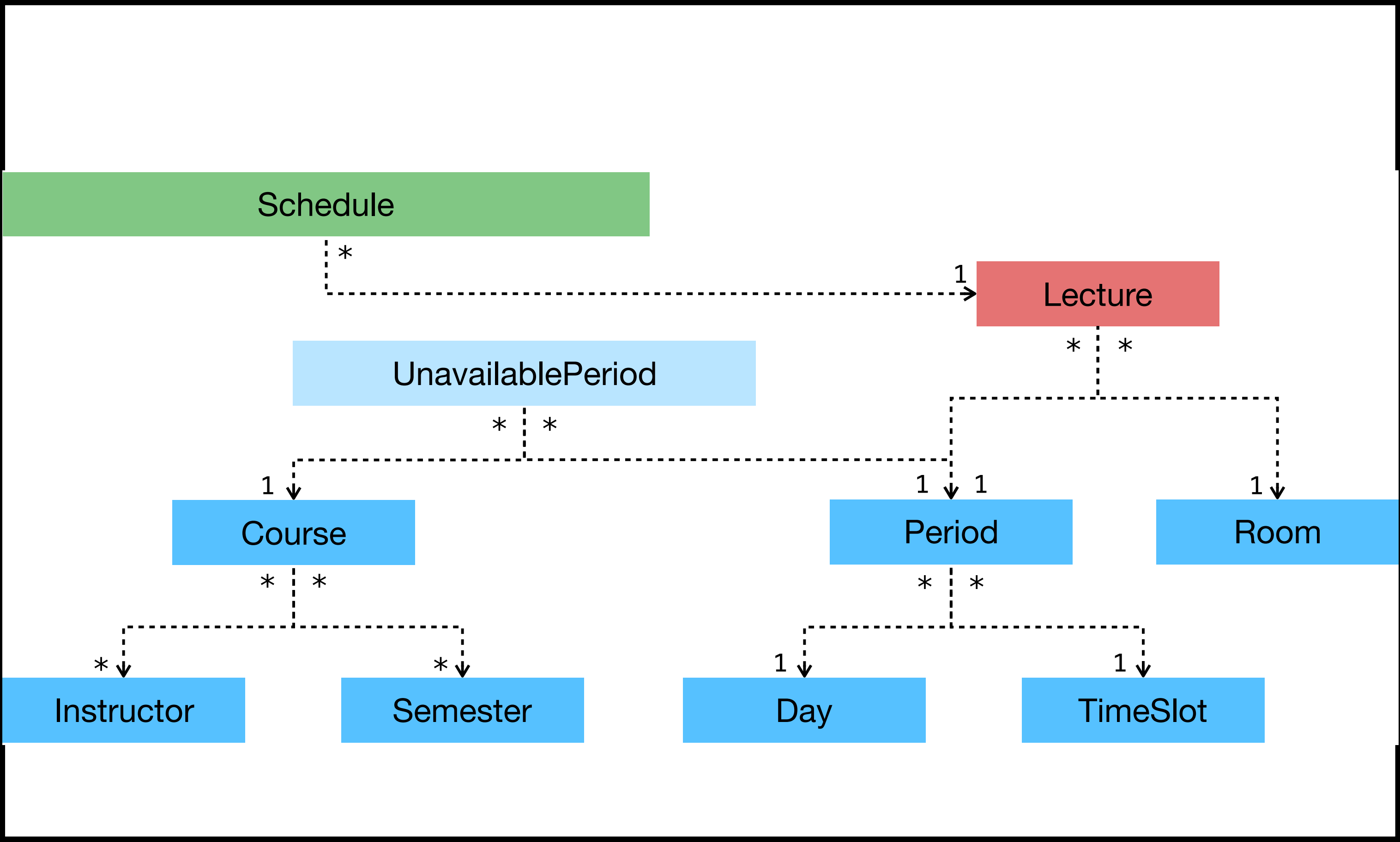
**Assistants:** Dr. A. Mocci, Dr. L. Ponzanelli

## Background

Creating and managing timetables of courses is an issue for many institutions because of the various constraints that need to be respected in the planning.

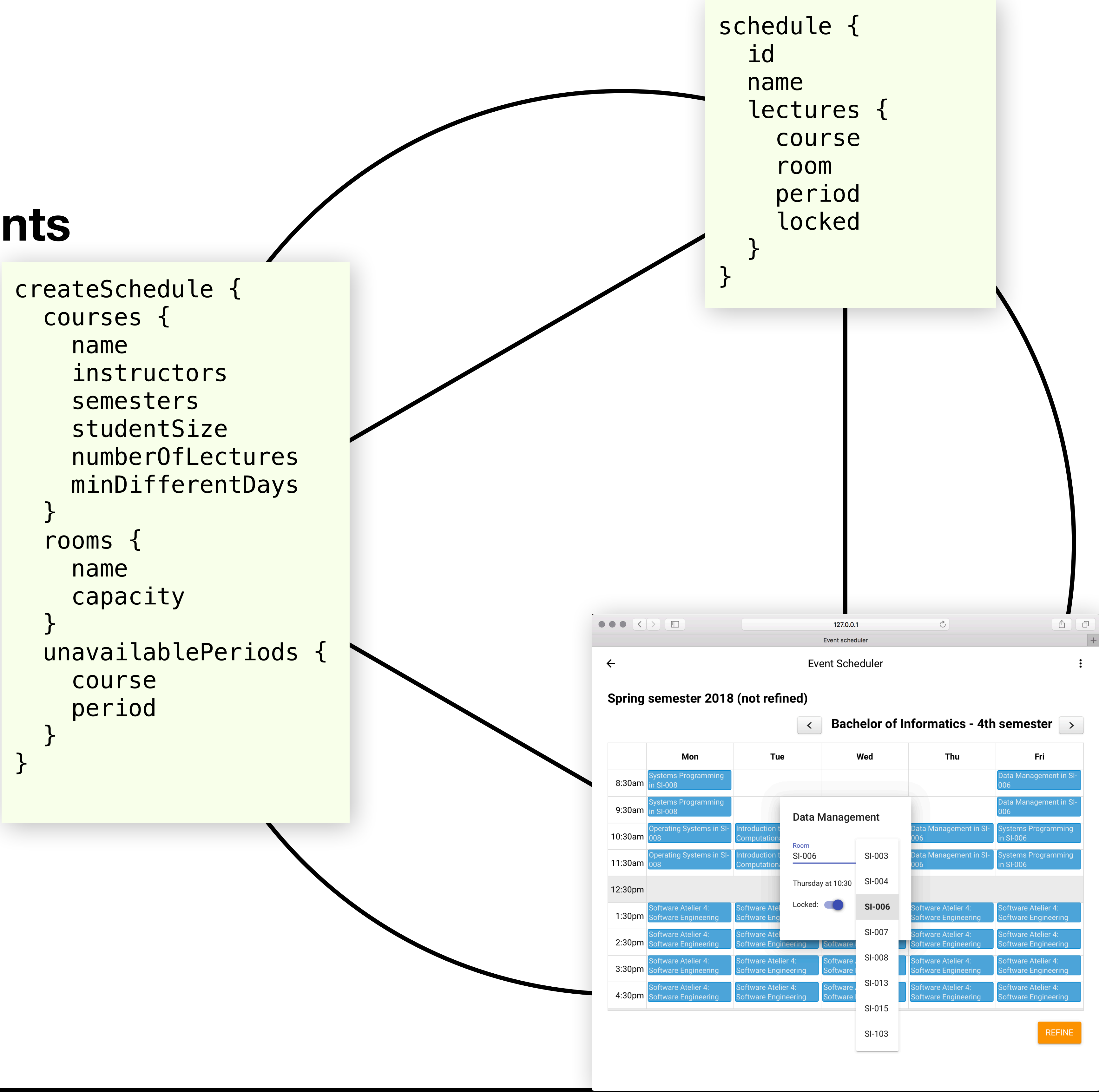
This is an even harder problem if the data needed to describe the planning problem and its constraints is not well curated and stored in several different places, a situation that often leads to a long and tedious manual work in creating the timetables.

In this project, we automate the process by means of state of the art tools to solve planning problems. The chosen tool is OptaPlanner, a constraint solver that requires to model the domain of the problem by means of a Solution class, for which a score needs to be computed. The Solution has a PlanningEntity which has variables that can be changed to improve the score. Everything else is constant for each problem instance and is referred to as a ProblemFact.



## Specify constraints

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Future work



Technologies  
(logos)



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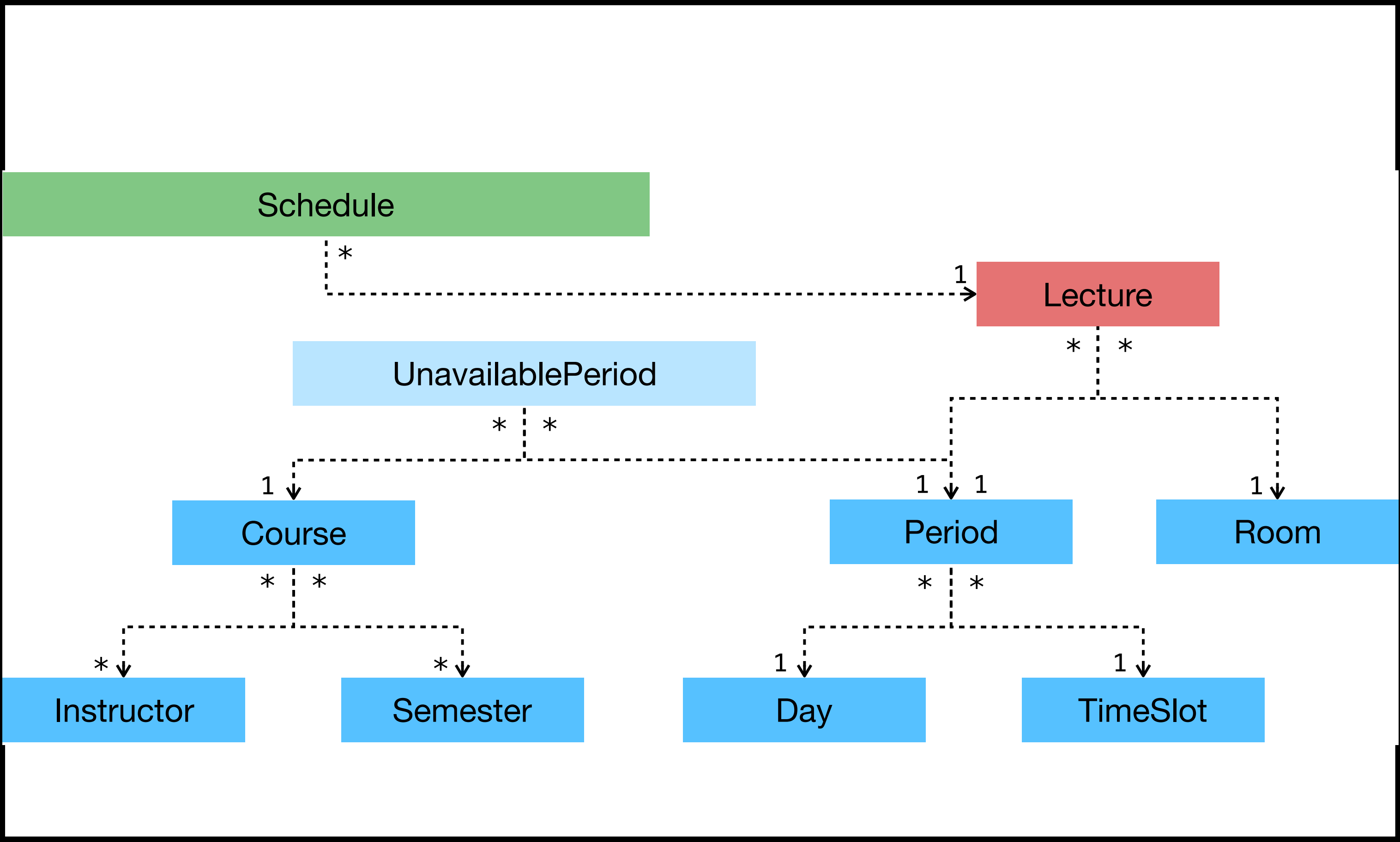
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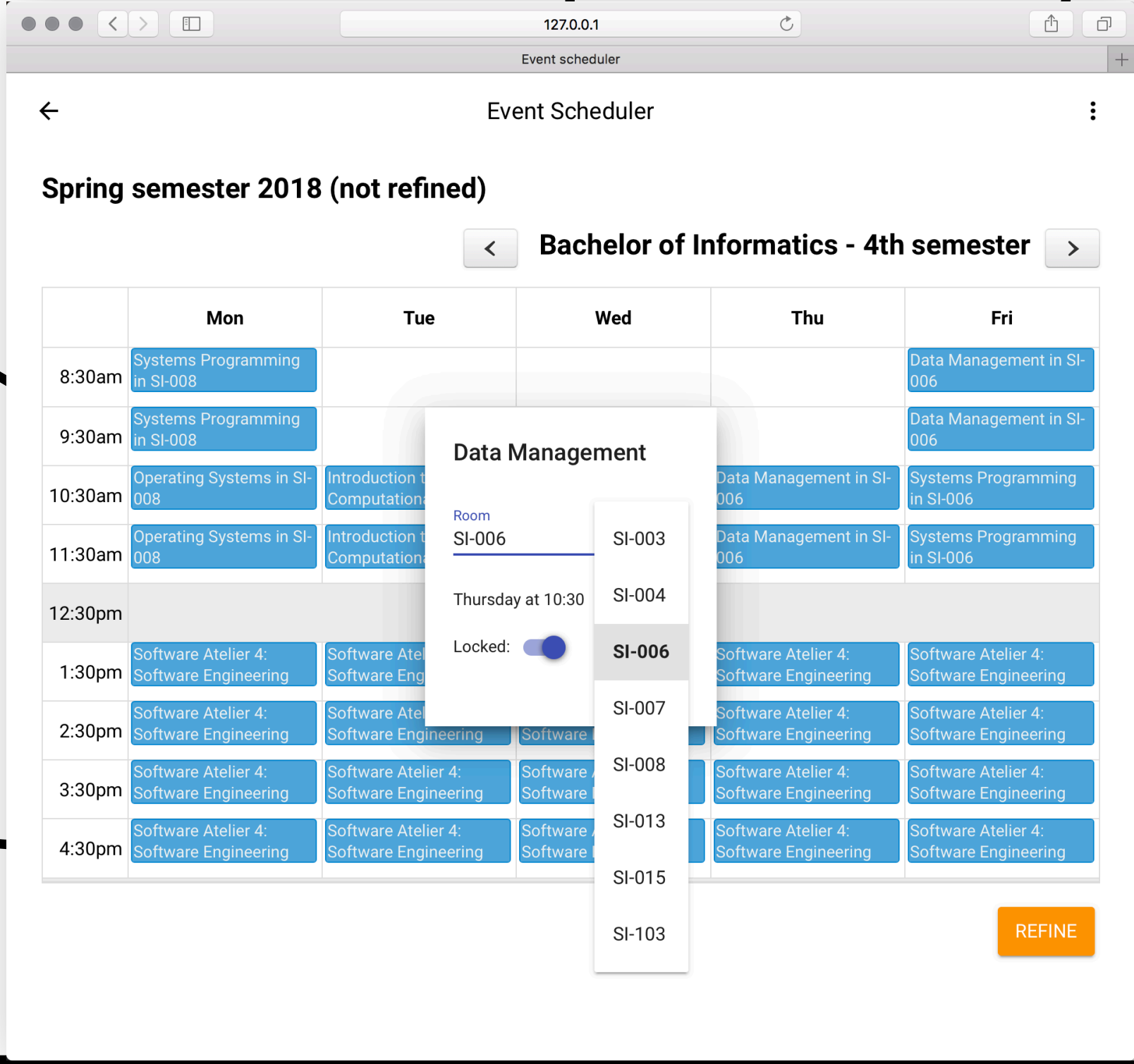
```
createSchedule {
  courses {
    name
    instructors
    semesters
    studentSize
    numberOfLectures
    minDifferentDays
  }
  rooms {
    name
    capacity
  }
  unavailablePeriods {
    course
    period
  }
}
```

## Solve and return solution

```
schedule {
  id
  name
  lectures {
    course
    room
    period
    locked
  }
}
```

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## Modify solution and refine



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## Future work

The web application allows to create a schedule for a predefined set of rooms and courses, with predefined unavailable periods. In the future it would be better to be able to select specify courses, rooms and other constraints from the front end application.

Other possible extensions include allowing to accept a final schedule and apply it to a specific time period, and then visualise real events on a calendar which offers various aggregated views, such as events by room or by day.

This calendar would then allow to add single events such as seminars, or conferences.

Technologies  
(logos)



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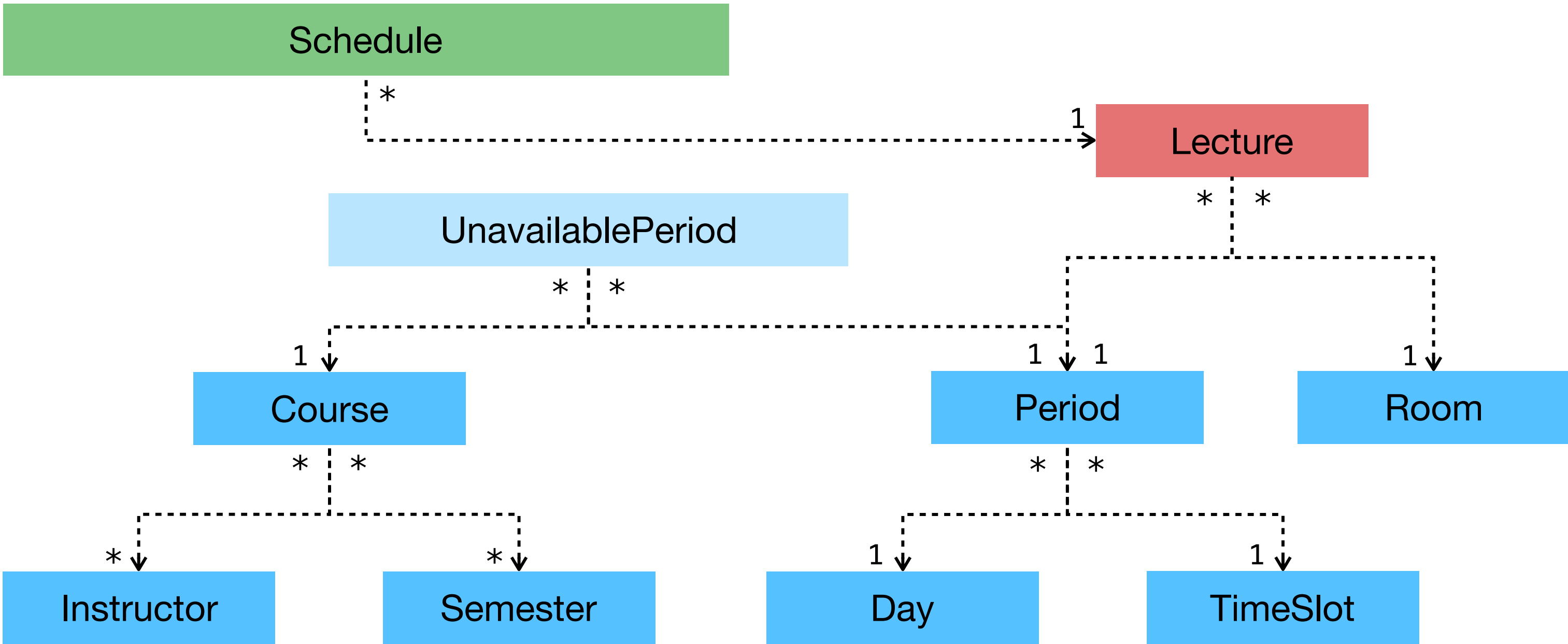
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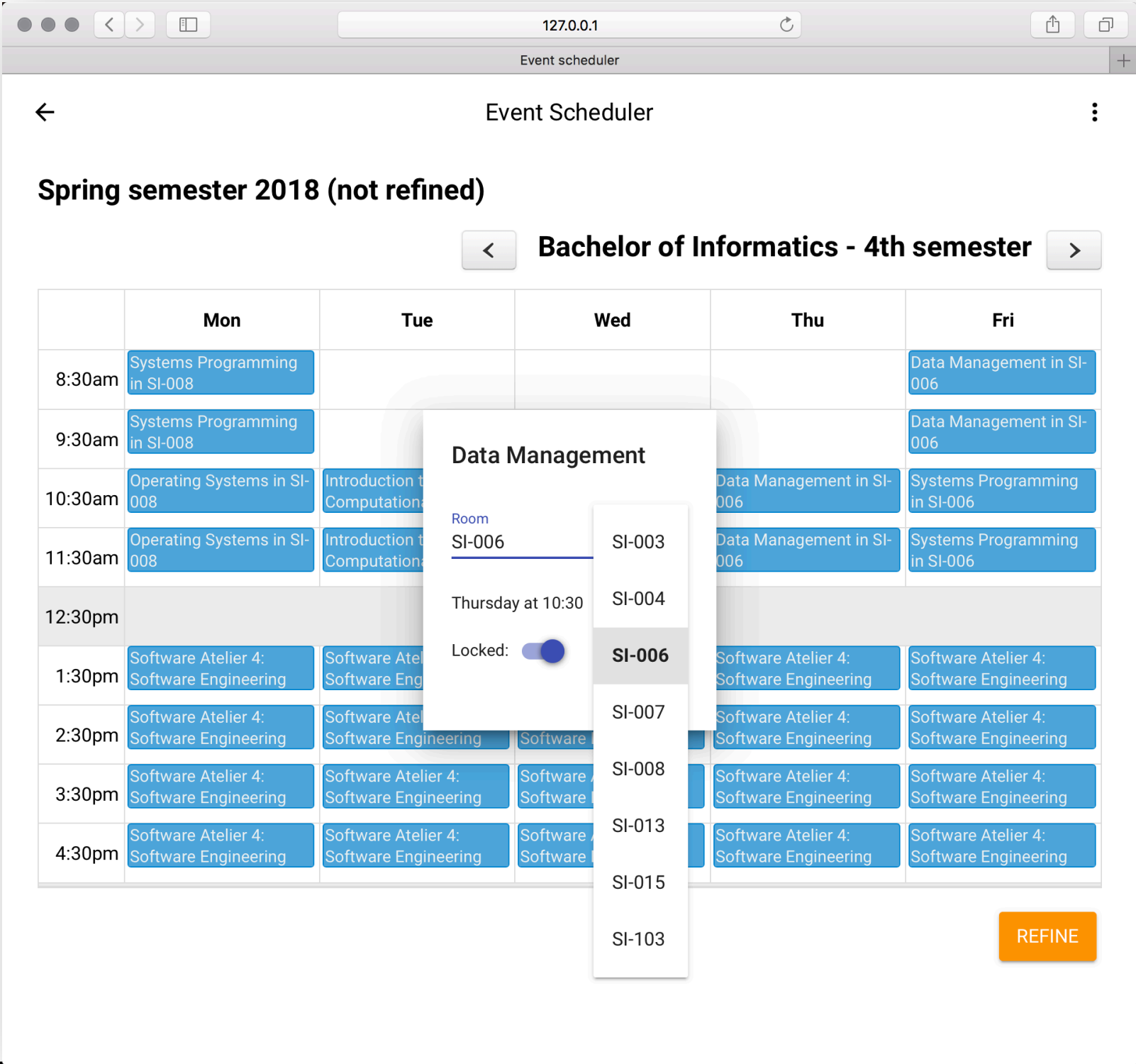
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