

## Schedule for Examination Session

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# Overview

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# Motivation

Schedule for examination session

Need for a semi-automatic solution

Simple user interface

# Problem Constraints

## Implemented Hard Constraints

- ▶ Exams scheduled per year and specialization
- ▶ Exams scheduled between start and end day
- ▶ Exams scheduled between hours 8:00 and 18:00
- ▶ Each exam scheduled in exactly one time slot where the duration of the exam is less than or equal to the duration of the time slot
- ▶ Professors should have at most one exam in any given time slot
- ▶ Students should have at most one exam in any given day

# Input Data Format

CSV file with Subject, Section, Teacher, Year

Subject	Section	Teacher	Year
IA	IR	V. Negru	3
P1	IA	C. Bonchis	1
ED	IR	L.Tanasie	3
P3	IE	A. Spataru	2

Table: Input Data Sample

# Solution

Python programming language

Constraint modelling

Z3 SMT Solver

# Graphical User Interface

Special Topics in Artificial Intelligence

Select a .csv file containing Exams

D:\Documents\Programming\Python Pro Browse

Number of days in examination session 10

Timeslots per day 3

Time per exam (expressed in hours) 2

Exams starting hour 8

Generate Schedule Clear Result

Exam-Name	Specialization	Year	Teacher	Day	Hour
AC	IR	1	L. Maftciu Scai	1	08:00 - 10:00
AC	IA	1	A. Popovici	1	08:00 - 10:00
Etica	IE	1	A. Craciun	1	08:00 - 10:00
PI	IR	2	M. Iordan	1	08:00 - 10:00
PI	IA	2	I. Tarba	1	08:00 - 10:00
PI	IE	2	Stinga Oana	1	08:00 - 10:00
MLL	IR	3	L. Tanasie	1	08:00 - 10:00
MLL	IA	3	V. Iordan	1	08:00 - 10:00
MLL	IE	3	M. Erascu	1	08:00 - 10:00

Save Schedule

Figure: Graphical User Interface

## Generated Schedule Result

Exam-Name	Specialization	Year	Teacher	Day	Hour
AC	IR	1	L. Mafteiu Scai	1	08:00 - 10:00
AC	IA	1	A. Popovici	1	08:00 - 10:00
Etica	IE	1	A. Craciun	1	08:00 - 10:00
PI	IR	2	M. Iordan	1	08:00 - 10:00
PI	IA	2	I. Tarba	1	08:00 - 10:00
PI	IE	2	Stinga Oana	1	08:00 - 10:00
MLL	IR	3	L. Tanasie	1	08:00 - 10:00
MLL	IA	3	V. Iordan	1	08:00 - 10:00
MLL	IE	3	M. Erascu	1	08:00 - 10:00
ASDI	IR	1	D. Zaharie	2	08:00 - 10:00
LC	IA	1	A. Fortis	2	08:00 - 10:00
AC	IE	1	C. Cira	2	08:00 - 10:00
MF	IR	2	M. Erascu	2	10:00 - 12:00

Figure: Generated Schedule



## Conclusion And Future Work

A functional application able to generate an examination schedule, while taking into considerations several hard constraints was created

Future work:

- ▶ Refactor code to improve time for processing and schedule generation
- ▶ Implement a more intuitive and better looking GUI
- ▶ Satisfy the hard constraint of having days set between exams
- ▶ Satisfy soft constraints of professor time preference and add solution to GUI