LupSeat: A Randomized Seating Chart Generator to Prevent Exam Cheating

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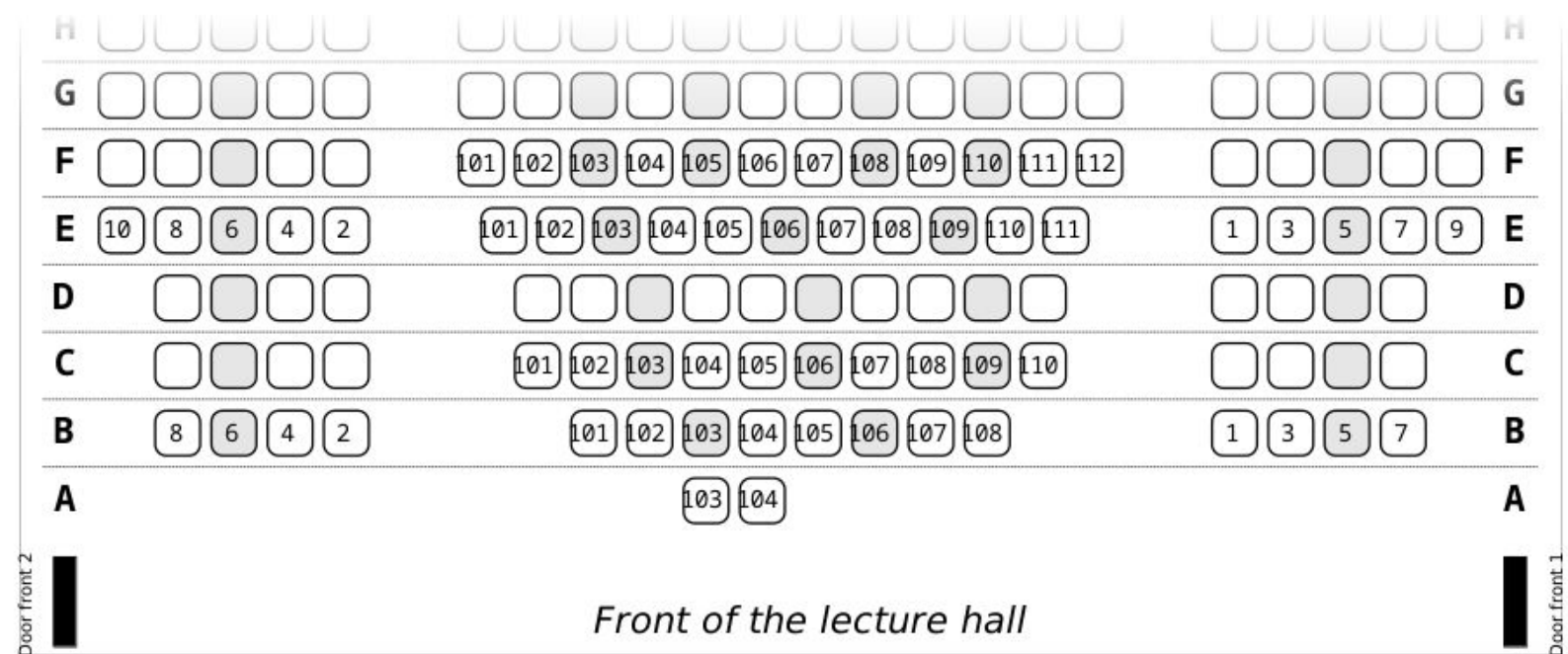
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Motivation

- I teach mostly large undergraduate classes, with a couple of written exams per class (e.g., midterm + final)
- Seating policy difficult to verify
  - *"You may not sit next to any students with whom you study or have studied, or spend time socially."*
- Experiment in Spring quarter 2019
  - 198 students in a
    291 seat lecture hall
  - Manual seating chart

SID (5 lower digits)	Seat (row/number)
00378	B7
00821	D101
01924	E9
02218	D107

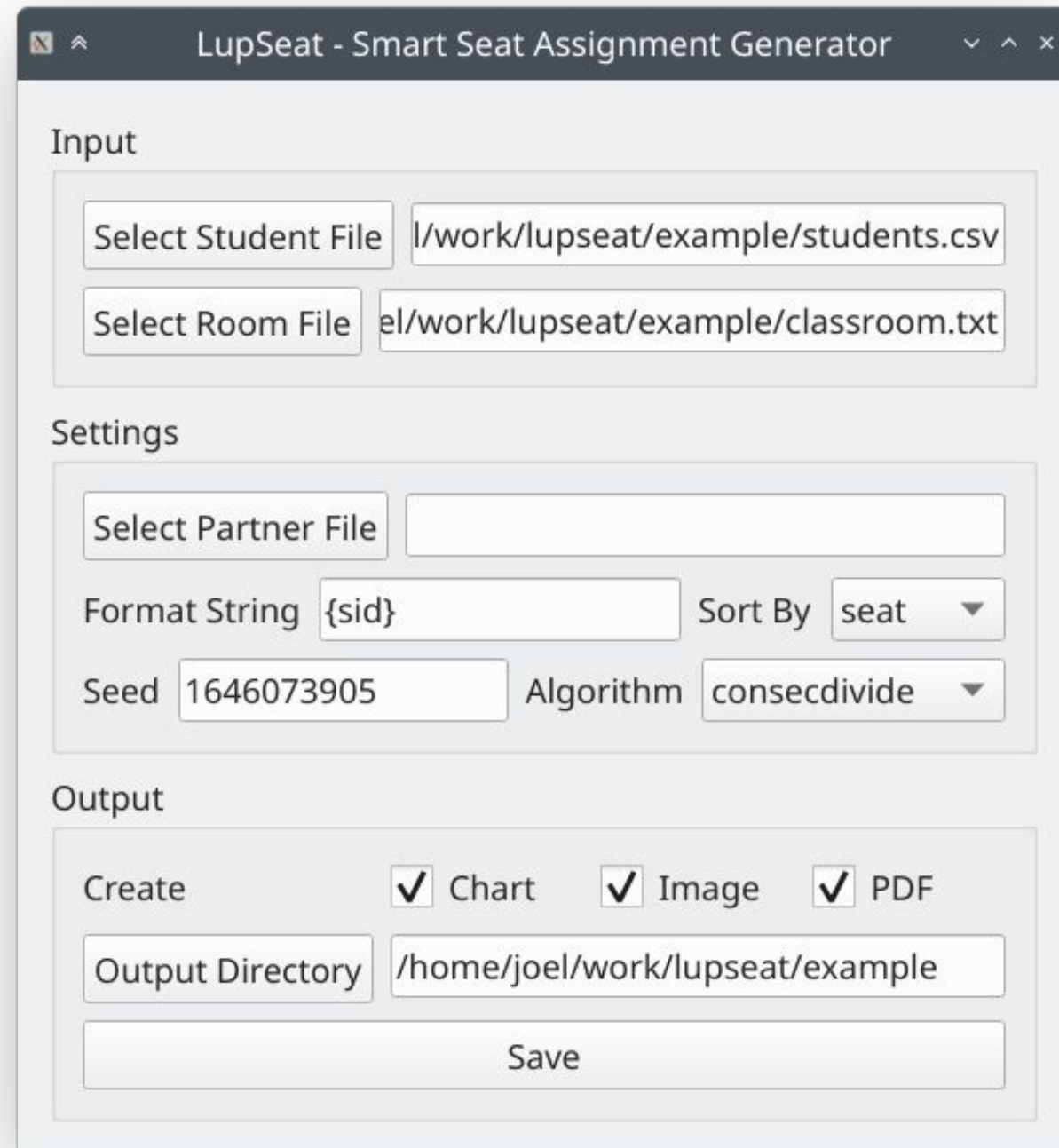|	
16590	O4
17053	C102
17067	G3
18918	E108
19828	J9
19886	G109

Background

- Cheating in CS has become an important concern

    - Study[1] found that 10% of the students cheated in the exams of a general science course at a top university!

- However, cheating drops if seating locations are randomly assigned

- Manually assigning seats can be a time-consuming process

    - Especially for large-enrollment classes (100+ students)

- Existing software solutions valid mostly for small classes only

    - Require significant human intervention

    - Offer only basic features

[1] Steven D Levitt and Ming-Jen Lin. 2015. Catching Cheating Students. Working Paper 21628. National Bureau of Economic Research. https://doi.org/10.3386/w21628

Overview


```
$ python -m lupseat \
    --student ../example/students.csv \
    --seats ../example/classroom.txt \
    --seed 1646073905 --sort_by seat --fmt
"{sid}"
Finished saving to file: chart.csv
Finished saving to image file: chart.pdf
Finished saving to image file: room.jpg
```

- Generates randomized seating charts from
  - CSV-formatted student roster
  - Textual representation of classroom
  - And other advanced settings...
- Graphical and command-line interfaces

Inputs

- CSV-formatted student roster

```
Carree,Heggs,1378,l
Ludvig,Quinane,1821,a
Charisse,Scemp,1924,
Hazlett,Michie,2218,
Freedman,Norree,2251,
Aurelia,Besantie,2794,
Leeland,Folbig,3072,l
```

- Textual representation of classroom

```
Seats:
a[1:1],a[3:5],a[6:9]
b[1:5],b[6:9]
c[1:5],c[6:9]
d[1:5],d[6:9]
e[1:5],e[6:9]

Specifiers:
b:c[2]
a:a[1]
l:a[6],b[6],c[6],d[6],e[6]
```
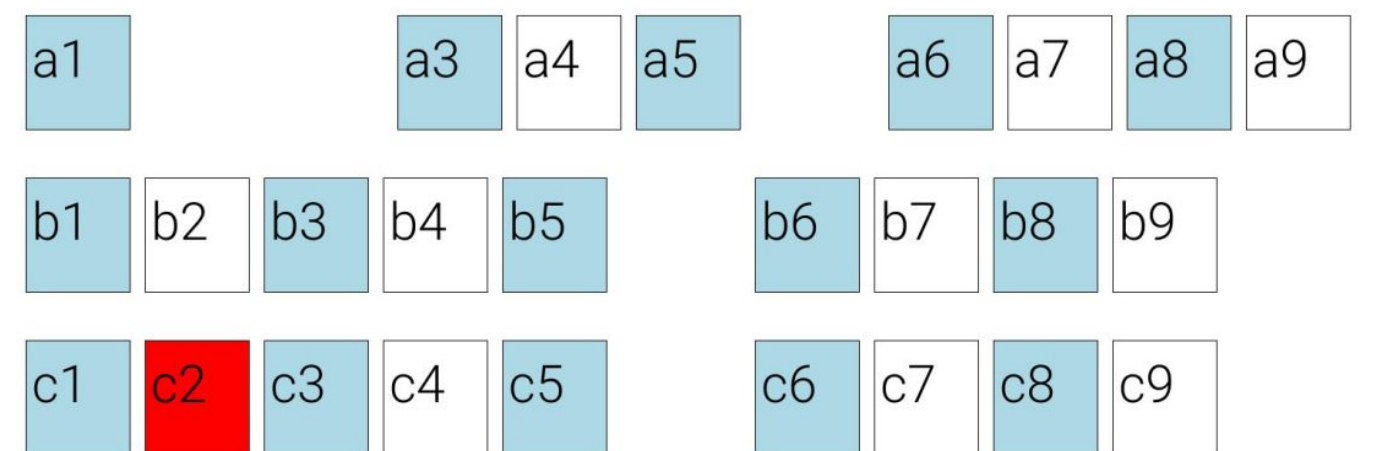
Outputs

- CSV-formatted/PDF seating chart

```
a1,1821
a3,8694
a5,5122
a6,9360
a8,9675
b1,3345
```

Seating Chart

a1	1821		e1	6873
a3	8694		e3	3198
a5	5122		e5	6871

- JPG room

Seating Chart

Broad range of features

- Multi-platform support
  - Windows, MacOS, GNU/Linux

- Specific seat assignment
  - Accessible seating
  - Left-handed students
- List of students who should *not* be sitting next to one another
  - E.g., project partners

- Customizable output
  - Various image sizes (letter, A4, etc.)
  - Association between seat number and any part of student information
    ```
    --fmt "{lname}"
    ``` or ```
    --fmt "{sid|0,2}"
    ```

Roadmap 2022

- Outreach to interested users
  - Hello SIGCSE 2022! 👋
- Stable version
  - Bug squashing
  - Documentation
  - Smooth multiplatform release process
    - Windows, MacOS, GNU/Linux
- Database of lecture halls
  - UC Davis (https://gitlab.com/luplab/lupseat/uc-davis-classrooms/)
  - Your campus?

Website:
https://gitlab.com/luplab/lupseat

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