

All Aboard Attendance July 24, 2019

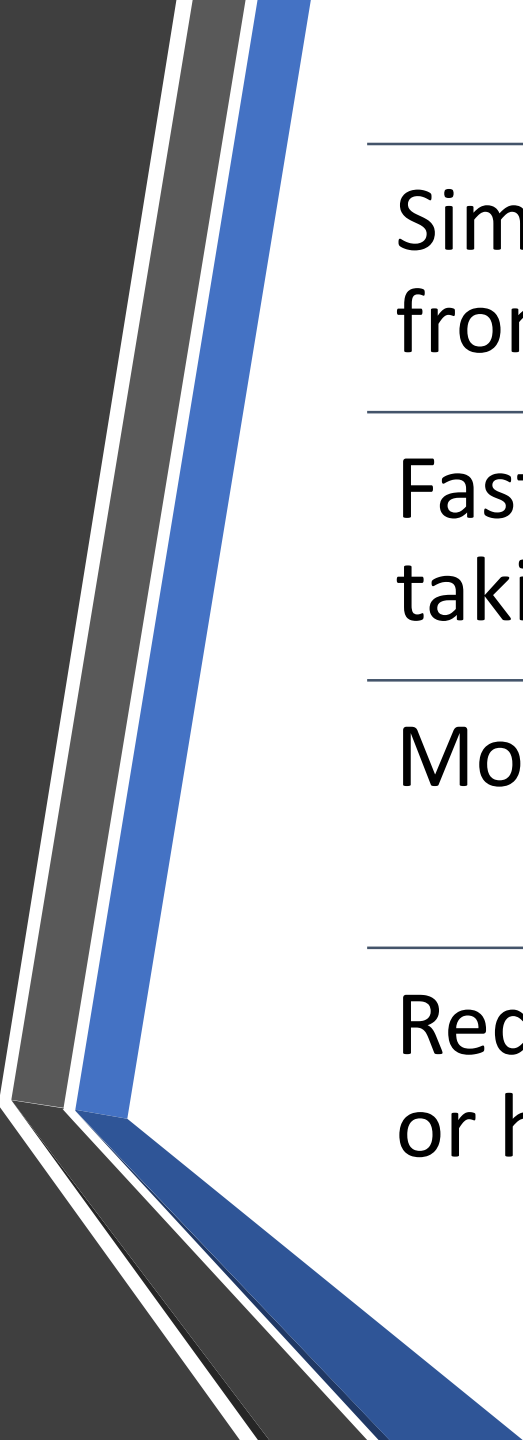
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Traditional attendance taking methods

Roll call – Too slow

Sign-in sheets – Easily tricked

ID scanners – Prohibitively expensive



What we
wanted to
achieve

Simple process that can be done
from a cell phone or laptop

Faster than traditional attendance
taking

More difficult to trick

Requires no additional equipment
or hardware



Challenges we faced

Entire team new to web development

The framework and almost every package we used had a learn curve

Learning new management style

Time constraints: Both in general length of projects and scheduling

What we
achieved

It's fast

It's simple to use

No extra equipment

Something even cooler...

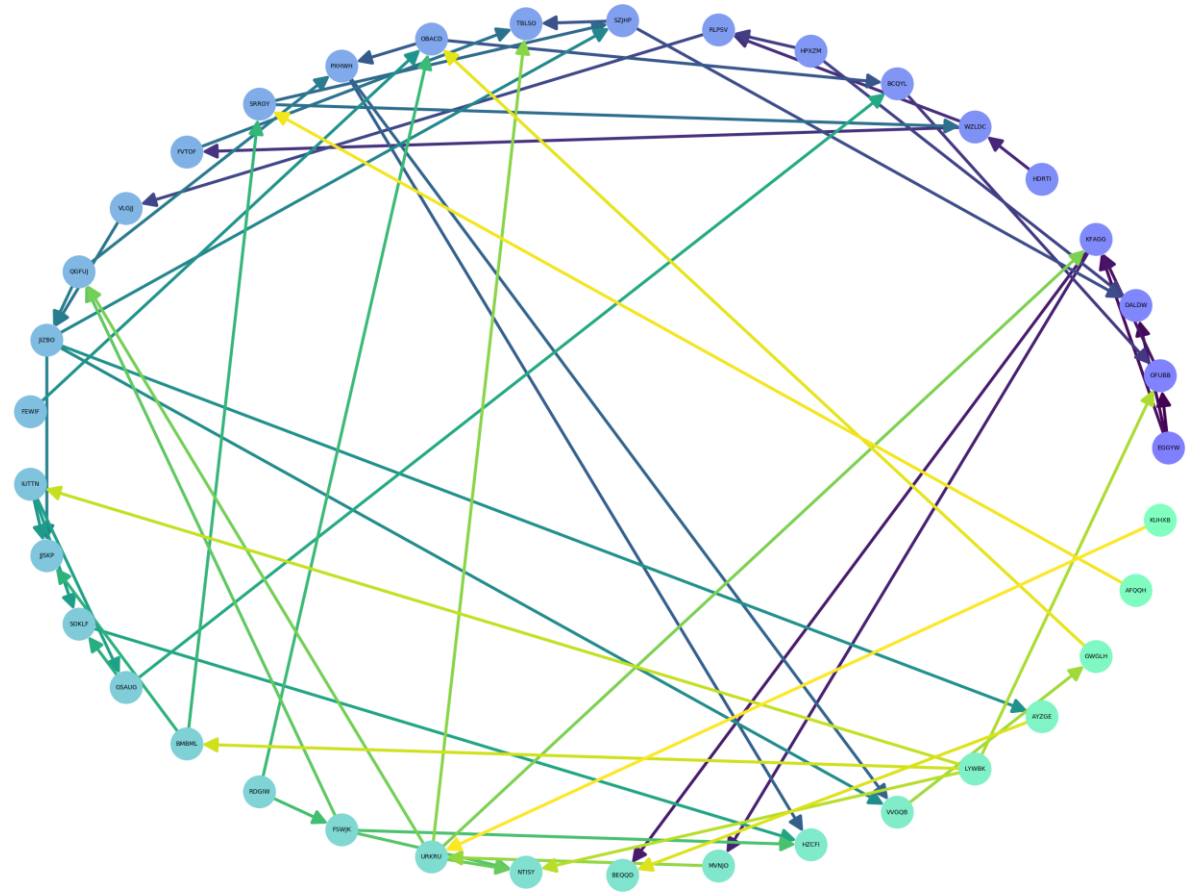
Something
cooler

Each student receives a unique
code for a lecture

To be marked present, students
exchange their code with other
nearby students

We keep track of these proximity-
based code exchanges

Data!



Why is this data useful?



See which students regularly attend together



Correlate with MOSS reports for plagiarism detection



Make final/midterm seating charts that break up students who regularly sit near one another



Generate new data for research

Frameworks
and
Technologies

Python, MySQLite

Django Web Framework

QR Code, NetworkX

Frameworks
and
Technologies

Python, MySQLite

- **Python:** High level object oriented language
- **MySQLite:** C-language library common in applications. It creates a fast and efficient database

Frameworks
and
Technologies

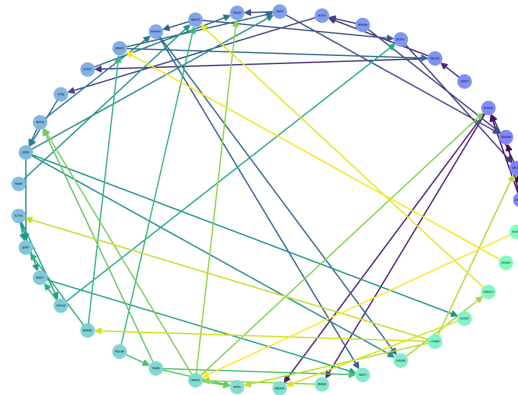
Django Web Framework

- Python based
- Simple organization and built in functions
- Efficient and fast
- Models: Interfaces with MySQLite

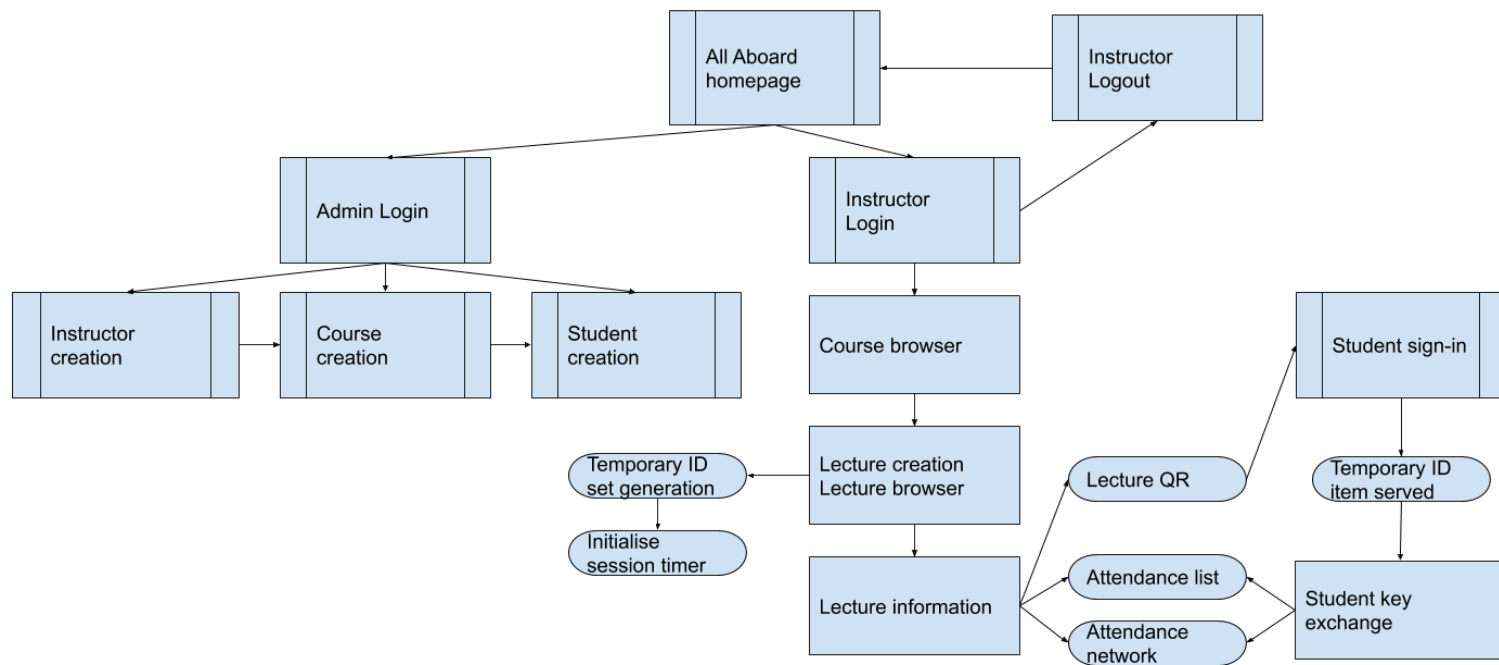
Frameworks
and
Technologies

QR Code, NetworkX

- Python libraries
- You'll see where specifically in the next slide



System Diagram/Overview



Home page

All Aboard Attendance [Home](#) [Courses](#) [Admin](#)

[Log In](#)

Welcome to All Aboard Attendance!

All Aboard Attendance is a new, efficient way of taking attendance. Instead of relying on roll call, sign-in sheets, or easily tricked login systems, All Aboard utilizes an insightful method to quickly take attendance and generate valuable data on student attendance trends.

To get more information about our system, please visit our [GitHub](#).

[Learn more](#)

You are not currently logged in.

If you are an instructor, please log in. If you are a student signing in for attendance, please scan your lecture's QR code.

Course index

- Inaccessible to students
- Only shows the courses associated with a specific instructor login
- Allows instructors to navigate the courses they are teaching
- Each course is a Django model in a sqlite3 database

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[Admin](#)

[Demonstration Course 1](#)

[Demonstration Course 2](#)

[Demonstration Course 3](#)

[Demonstration Course 4](#)

Demonstration Course 1

Lecture Title: [Start New Lecture](#)

First lecture

created July 21, 2019, 5:50 p.m.

Second lecture

created July 21, 2019, 5:50 p.m.

Third lecture

created July 21, 2019, 5:50 p.m.

Fourth lecture

created July 21, 2019, 5:50 p.m.

Fifth lecture

created July 21, 2019, 5:50 p.m.

Lecture index

- Lectures contain the attendance information for a course
- From this page, instructors can navigate to previously held lectures or create new ones
- Like courses, lectures are Django models in our database

Lecture attendance page

- Attendance information is rendered into a user-friendly format
- A QR code containing the student sign-in URL is presented for instructor use
- Sign-ins are time locked for 15 minutes after lecture creation
- The connection counter tracks how many attendants a specific student has exchanged ID with
- A NetworkX graph is rendered on page refresh that matches the current lecture attendance.



www.AIRDomain.com/course/23462934/sign-in/

| Student ID | Attendance | Present |
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Site administration

ACCOUNTS

Users

+ Add

✎ Change

COURSE

Courses

+ Add

✎ Change

Students

+ Add

✎ Change

Recent actions

My actions

+ tom
Student+ lisa
Student+ anne
Student+ sam
Student+ chad
Student+ greg
Student+ sally
Student+ billy
Student✖ Sample Student 1
Student✖ Sample Student 2
Student

Admin page

- Courses can be created and assigned students
- A course represents a class offered for a term, e.g., CMPS 101 Fall 2019
- Instructor accounts can be made and assigned to courses
- An instructor account is generally held by the professor for the course

Management Techniques

Everything Scrum (Google Sheets, Discord, GitHub)

Required tutorials and educational material

Style and comment standards

Routine meetings, as close to daily as possible

Minimum Viable Product

As a **student**, I want my attendance to be accurate so I receive fair credit

- Currently student login is easily tricked, resulting in false positives for attendance.
- We have limited false negatives by providing detailed warnings and clear instructions on student attendance pages.
- Future releases should tether institution-wide logins with attendance logins. For instance, a Canvas login could be used.

As an **instructor**, I want attendance to be taken quickly so I can maximize lecture time

- The closer students sit together, the faster the process.
- Exchanging ID with two adjacent students takes less than thirty seconds. In optimal seating cases, attendance can take less than a minute!
- In larger (100+ student) lectures with sub-optimally seated students, we anticipate a worst-case of five minutes for accurate attendance.

As a **researcher**, I want data on student seating trends so I can create new insights

- All necessary data is stored and can be queried from the database.
- Student-to-student connection direction is also tracked, with the edge pointing to the student who enters another student's ID.
- Only one network visualization is built in to this release.
- In future releases, a large variety of visualizations and analytics should be implemented.

The background of the slide features a series of concentric, curved lines in a light gray color, creating a sense of motion or a stylized globe. These lines are more prominent on the left side and fade out towards the right.

Likes / Dislikes

WHAT WE LIKED

Learning how to track activity and productivity for group members

Working on our own project without an assignment description

Wading into web development and database management

WHAT WE DIDN'T LIKE

Scheduling in person meetings was difficult

Being new to Django and Scrum caused a lot of errors and delays

What we learned

Accountability is huge in project management

We improved our Scrum planning skills significantly

Remote conferencing isn't ideal. In-person was better

Stay Mindful of Global Architecture (i.e. limit dependencies)

We learned a lot about Django and web development in general

Wish we had more time. Doesn't everyone?



Q&A