



Attendance Monitoring Data Visualisation

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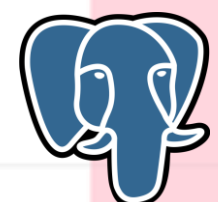
The underlying graph presents average teaching session attendance versus absence over 4 Snapshots of Autumn 2017 for the Department of Informatics.

Background

- Attendance and attainment in higher education have a proven link
- Student numbers are on the rise: **18,510 in 2020-21, likely more now**
- Number of staff monitoring student attendance have stayed the same: **~1 per school**

So the attendance monitoring workflow needs to be optimised

Aim: Create a Web Application that presents useful visualisations, gives alerts etc.



Postgres Database

PostgreSQL Server with 3 Tables: Student (1357 rows) corresponding to each Student in the dataset, Snapshot (5402 rows) corresponding to each 'snapshot' taken every three weeks, and Course (55 rows) corresponding to every course in the dataset.



Flask API

Flask server serving endpoints with data from the PostgreSQL database to the React front-end. Written in Python3 with SQLAlchemy.

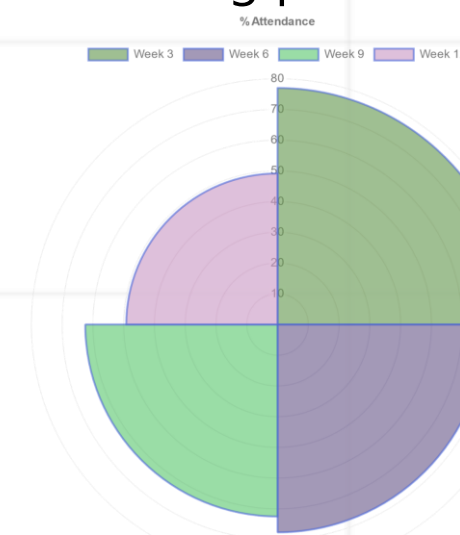


React User Interface

Multi-page React app fetching data from Flask API and presenting charts with ChartJS.

Visualisations

In addition to building out the aforementioned technology stack, this project also investigated different types of visualisation, such as but not exclusively, the Polar Area graph which was found to be very useful for viewing percentages change over time:



And of course more well known visualisations like line and bar charts:



Filtering

To allow users to filter and view data in table and chart form, the following UI/page was created:

Table

Student ID The student's unique identifier.

Year

Registration Status If the student is registered or withdrawn for a specific reason.

Semester (Autumn or Spring)

Week (1-12)

Switch your view once you've set a filter [View as Line Chart](#)

student_id	year	semester	week	insert_datetime	registration_status	teaching_sessions	teaching_attendance	teaching_explained_absence	teaching_absence	teaching_last
42003972	2017	Autumn	3	2023-03-30 22:56:20.897570	REGISTERED	21	5	2	14	2017-10-16
42806822	2017	Autumn	3	2023-03-30 22:56:28.940176	REGISTERED	18	16	0	2	2017-10-16
42003972	2017	Autumn	6	2023-03-30 23:00:20.078747	REGISTERED	11	7	2	2	2017-11-03
42806822	2017	Autumn	6	2023-03-30 23:00:27.625997	REGISTERED	12	11	0	1	2017-11-06
42003972	2017	Autumn	9	2023-03-30 23:04:05.031943	REGISTERED	11	4	0	7	2017-11-24

System Structure

