AMVis: A web-based Attendance Monitoring Visualisation solution

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Aims

Attendance and attainment in higher education have a proven link, and there is a large demand of higher education in the modern world. These result in a mammoth administrative task of monitoring the attendance for large cohorts of students. This is a problem that is only growing for the University of Sussex and similar institutions as they take on more and more students. There is no current application that fits the niche of visualising attendance data for this purpose. Therefore, there is considerable need for an application that takes in raw attendance data and creates meaningful and actionable visualisations for use by administrative staff, as well as configurable filters for these staff to extract visualisations of data they select.

This project will therefore aim to begin filling this niche with meaningful visualisations, stemming from user feedback, and aim to develop a configurable system for making such visualisations.

Objectives

Primary Objectives

1. Import attendance data into an effective and efficient database
2. Construct a well-structured and efficient database to store attendance data, and import sample attendance data
3. Create meaningful visualisations of attendance statistics for use by relevant staff
    a. Per Student
    b. Per Degree
    c. Per Stage
    d. Per Department & School
4. Get user feedback from relevant staff: in this case our Director of Student Experience, Dr Kate Howland, who due to her background in Interaction Design and as a user may be an asset in terms of specific feedback.
5. Apply this user feedback to improve visualisations and the system at large
6. Allow users to apply filters to data and create visualisations with this dataset

Extensions

1. Create a full-stack web application around the visualisations, featuring
    a. A ReactJS front-end
    b. A Python (Flask) back-end
    c. MySQL Database
2. Make the application user configurable, including different dashboards of visualisations
3. Investigate further ways to visualise attendance data e.g. Nightingale Rose Charts
4. Find meaningful statistics for student engagement beyond just quantity

Relevance

This project sets out to research and deliver useful attendance visualisations to aid staff (primarily at the University of Sussex, but this could be extended beyond) concerned with attendance. As it is based around a web application, database, and data analysis, this project closely relates to my degree (Computer Science Integrated Masters) and has potential to inform decisions for my masters year, as well as my preferred career in Software Engineering, as that

much like my project, would include plenty of project and time management opportunities, as well as design around users which is currently being informed by the Human-Computer Interaction module.

This project will allow me to test and improve my skills in Databases following the module in second year, revise and extend my statistics knowledge from Mathematical Concepts, and investigate the domain of Data Science.

Resources Required

This project will require use of my University of Sussex User Webspace for development though it may end up hosted elsewhere later. It will require use of School of Engineering and Informatics Lab machines for development where necessary.

Weekly Timetable

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0900	Lecture				Lecture	
1000	Lecture	Project / Coursework	Project / Coursework	Starting Lab Early	Lecture	Project / Coursework
1100	Lecture	Project / Coursework	Project / Coursework	Lab Class	Lab Class	Project / Coursework
1200	Project / Coursework			Lecture		
1300	Project / Coursework	Lecture				
1400	Project / Coursework	Lecture				
1500	Project / Coursework				Project / Coursework	
1600	Project / Coursework				Project / Coursework	
1700						
1800						
1900				Seminar		

Rough Project Timescale

Late October/Early November: Plan and create a Database, importing the sample data.

November/December: Start producing visualisations and system backend. If any are good enough to show, then show to stakeholders and ask for feedback

December/January post-exams: Resume producing visualisations and system backend

February onward: Increase development speed with the increased module weighting, finish up core functionality and put development hours into most useful extensions

Bibliography

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React (no date). Available at: https://www.fullstackpython.com/react.html (Accessed: 11 October 2022).

The Data Visualisation Catalogue (no date). Available at: https://datavizcatalogue.com/index.html (Accessed: 11 October 2022).

Kelly, G.E. (2012) 'Lecture attendance rates at university and related factors', *Journal of Further and Higher Education*, 36(1), pp. 17–40. Available at: https://doi.org/10.1080/0309877X.2011.596196.

Interim Log

30/09: Initial Group Supervisor Meeting

03/10-06/10: Planning ahead of One-on-One Meeting – See Bibliography

07/10: One-on-One Supervisor Meeting

10/10-14/10: Writing and sending my Project Proposal