Random Patient Clinical Data Simulator

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Project Overview

Access to real patient data is important for teaching purposes and research. However, due to law this data is protected and can only be used by people who have permission to access it.

The aim of this Random Patient Clinical Data Simulator project is to develop random data about patients using real world statistics (e.g. Percentage of males and females having diabetes at the age of 16+) and then visualising that data so it's easy to understand.

To make the application usable real statistics based on Scotland will have to be used in order to generate this data.

List of Achievable Objectives

- Random patient demographic data (Name, Gender, Age, Postcode and Community Health Index Number)
- Create a series of patient's clinical data sets using demographic data (e.g. Summary of primary care record with a list of conditions, clinical encounters, medication data coherent with patients' condition, lab sets and secondary care sets)
- Validation for data sets
- Implement a 1% out of range results to create imperfections in the data
- Visualise data sets using appropriate graphs

Survey of Related Work

Simulation based learning in a health education environment has some advantages over other teaching methods used in that field depending on context, topic and method. By creating this application, students who are studying to be a health professional can practice analysing patient data and statistics which can result in additional gains in knowledge, critical thinking ability, satisfaction or confidence based on studies. [1]

Overview of Methodology

The project methodology will involve studying statistics relating to 10 most common health conditions (5 chronic conditions and 5 non-chronic conditions) in Scotland. This is going to be the first required in order to give appropriate conditions to appropriate random patients.

The design stage of the project will involve a sketch of the graphical user interface to have a rough idea how to application should look in the end of the implementation process.

During implementation is going to follow the Waterfall Development Methodology. This is the best methodology for this project as requirements (e.g. gather statistics) and design will have to take place first as otherwise time would be wasted during implementation stage if statistics would have to be gathered during the implementation of the project.

After implementation phase verification phase will take place which is going to consists of creating tests to validate data and the functionality of the application.

Project Evaluation

Evaluation of the project will consist of:

- Checking if appropriate statistics has been used to generate data
- Checking if data is valid after generating it
- Checking if data is appropriately visualised
- How user friendly is the design of the graphical user interface
- Checking if appropriate help messages are displayed to improve user friendliness

Initial Project Plan

24th October – 21st November (4 Weeks)

The most important part of this project is to gather all requirements before starting to develop the application as otherwise there is going to be time wasted on changing values created before which might not even be anywhere close to the real-world statistics.

- At this stage of the project the time is going to be used to gather all the requirements to generate usable data.
- After gathering all the requirements design of the application can take place.
- After having a design of the application early stages of application development can take place.
- Research what is the best way to generate statistical data and visualise it.

21st November – 1st of December (1 Week)

- Background review chapter draft submitted to supervisor.

1st December – 15th of December (2 Weeks)

- Problem specification / Software specification Chapter submitted to supervisor.
- Prepare project progress presentation.

15th December – 26th January (6 Weeks)

- Start programming the project.
- Implement random patient data details without any conditions.
- After having random patient data created conditions will be added and randomized based on statistics.

26th January – 15th February (3 Weeks)

- Implement data visualization of patient's data using appropriate graphs.

15th February – 22nd February (1 Week)

- Software testing.

22nd February – 1st March (1 Week)

- Software development chapter submitted to supervisor.

1st March – 15th March (2 Weeks)

- Analytic evaluation chapter submitted to supervisor.

15th March – 22nd March (1 Week)

- Full report draft submitted to supervisor for comments.

22nd March – 25th March (3 Days)

- Submit the project and the project report.

Marking Scheme Chosen

The marking scheme for this project is going to be “Experimentation-based with Significant Software Development” this is because before developing the application a lot of research will have to be done beforehand to gather all the requirements in order to generate usable data for the application.

Supervisor Comments

I have discussed and reviewed the project scope proposal with Karol and made some suggestions about deliverables and project plan which he has now incorporated in this revised project scope.
I confirm that the project has now been approved as it stands and can be formally submitted.

References

[1] Cant R.P. & Cooper S.J. (2010), “Simulation-based learning in nurse education: systematic review.” Journal of Advanced Nursing66(1), 3–15.

https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1365-2648.2009.05240.x