

Software Engineering 303

User Interface Design

Group Project

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Abstract

The project is worth 40% of the overall grade for the course, and will involve you designing and evaluating an information visualisation software application. The project will be completed as a team of between two to three individuals.

The grade is split into two main deliverables: an individual report on the visualisation design and team process (and indirectly the visualisation itself) which is worth 20%; and a group presentation worth 20%. The total project should take around approximately 50 hours to complete per individual.

All aspects other than the individual report should be completed as a team.

1 Mission

Your mission is to design, implement and evaluate a software system for an information visualisation application. The information visualisation system should allow a user to interactively explore a dataset containing the results of all matches in the first six seasons of the ANZ Championship.

The purpose of the interactive information visualisation is to allow a user to identify trends and patterns in a variety of different aspects. A non-exhaustive list of possible aspects are:

- the performance of a specific team, both in terms of their final placing in each season, and on how they perform at specific parts of a season (such as early-season, mid-season, at the end of the regular season, or in the finals).
- the value of home court advantage by team and by country, and how (or if) this has changed over time.
- the performance of teams from a particular country, and how they have fared in inter-country matches.

New Zealand	Australia
Central Pulse	New South Wales Swifts
Northern Mystics	Adelaide Thunderbirds
Waikato Bay of Plenty Magic	Melbourne Vixens
Southern Steel	West Coast Fever
Canterbury Tactix	Queensland Firebirds

Table 1: ANZ Championship Teams by Country.

- specific rivalries between teams that typically have close results, and where each team in the rivalry has won at least 25% of the games between the two.
- how teams do at certain venues, including how teams fare at different home venues that they alternate between.

Users will — at the very least — want to filter data by season, by country, and by regular-season vs finals. Note however that information visualisation systems can uncover trends and patterns not otherwise identified through other means, so credit will be given for providing users with useful tools to explore the richness of the data set.

While the information visualisation system will not be directly assessed, a poor system will reflect badly on the final report, and an ill-thought-through initial design will reflect poorly on the presentation.

The system will not be assessed on the use of coding standards, internal software architectural decisions or on the coverage of unit tests. We will not be looking at the internals of your code when assessing your system. However, we reserve the right to deduct marks from the final report if the system has software bugs. Good software development practices will greatly assist you in avoiding software bugs.

2 ANZ Championship

The data domain is a sports league. The ANZ Championship is a trans-tasman netball league that currently has seven completed seasons (2008 — 2014). We will use the first six seasons as representative data. The league has always contained ten teams: five from New Zealand and five from Australia. These teams have not changed over the past six seasons, and the format of the season has also not substantially changed. The ten teams are listed in table 1.

In each season, a team will play thirteen matches. Each team plays every other team from the same country twice: home and away. Each team plays every team from the other country once: either home or away. In every year except 2011, these thirteen matches are played over fourteen rounds, with each team also having a bye at some point in the season. In 2011, the season was compressed due to world championships, and there were no byes, and some teams played twice in a single round.

A win is worth two points in a league table. There has only ever been one draw: West Coast Fever vs Central Pulse in 2008 when there was a stadium failure that caused the match to be halted before full time. Matches that have tied scores at the end of full-time require extra-time.

The match scheduled in Canterbury when the Christchurch Earthquake struck was delayed until later in the season and played elsewhere, however it was recorded as a normal result.

At the completion of the regular season, there is a finals series:

1. The top two placed teams play in a major semi-final.
2. The third and fourth placed teams play in a minor semi-final.
3. The winner of the minor semi-final play the loser of the major semi-final in a preliminary final.
4. The winner of the major semi-final and the winner of the preliminary final play in the grand final.

The finals series is played over three weeks: typically weeks 15–17 of the season.

3 Data

You will be provided with six CSV files, each representing a different season. To make life slightly more complicated, the files differ slightly in format. Much of the difference is in whether the time is combined in with the date field. However, there is also a difference in the 2009 data where the full-time score is recorded alongside the final score in extra-time games. All the files are internally consistent, the issue is with inter-file consistency.

I have manually constructed the CSV files by collecting data from each season's respective Wikipedia page, and applying some cleaning on the data. The remaining consistencies can be cleaned up programmatically by using commonly available scripting languages. You can also clean the data manually, although this may be more work.

4 Users

You are designing your system for use by the general public. You can expect the audience to have a basic understanding of Netball (i.e. that scores are measured by goals), however you should not expect all users to automatically know specific details around the league (i.e. that the Firebirds are an Australian team, without any filtering/visual cue to that effect).

You can assume that the general public also have a basic knowledge of how leagues typically run (i.e. with a regular season followed by a finals series),

although not necessarily specifics around the ANZ Championship itself (i.e. a 14 week regular season followed by a 3 week final series).

You should also design your system on the basis that future seasons could be added to the data set (as long as those seasons have the same structure). Roma and I may have the 2014 dataset handy, for example, and choose to load it into your system. Any hypothetical 2014 data set would follow the same naming scheme, schema and placement as the 2008 – 2013 data sets.

However, your visualisation should be designed to accommodate more than just one additional season (of the same type and structure).

5 System

The system itself is indirectly assessed through the presentation and final report. It must be submitted through the online submission system by June 26th.

5.1 Implementation

You are to use D3 to develop your visualisation, as this is a domain-specific tool that is widely used to generate visualisation systems. D3 has good tutorials and documentation, and has built-in support for visualisation techniques.

You can target the same browsers and systems as for assignment 2, and you may use external libraries if their licensing permits this. Note however that you'll be assessed on what you add to the design and implementation.

Standard D3 has sufficient features and functionality to score highly on this project, with appropriate consideration for users and design.

6 Group Presentation

A presentation outlining your initial design and an approach to assessing the system with users (either through a usability evaluation or experiment) is the first deliverable of this project.

All presentation materials are due in by 10:00am on Tuesday, June 2nd, although presentations themselves will run across the week. The reason for having a set time for submitting all materials is so that all teams are on a level playing field.

The slides should include additional simple speaker notes covering the major ideas you intend on presenting. This is to ensure that you have thought of the major ideas you present prior to hearing other teams present those ideas.

All group members are required to contribute towards the creation of the presentation. However, groups may choose to only have one or two members actually speak. All group members who contribute to the creation of the presentation will receive the same group mark, irrespective of whether they actually speak.

Presentations will be assessed both on content and delivery, and teams will have no more than 10 minutes to present. There will be no question and answer time.

6.1 Grade

Your group will be awarded an overall letter grade for the group presentation, in line with the grade descriptions stated in the Assessment Handbook (available via the University website).

A marking guide that we will use for assessing the presentation will be published during week 10. While the grade will not be mechanically calculated from the marking guide, nonetheless it will be a useful indicator of what we'll be looking for.

7 Final Report

You will need to submit a final report — individually undertaken — identifying the key design decisions (both from a visual and interactive sense), along with justifications of these decisions, and a discussion of the development process.

This guide should be in the same format as previous assignment reports, and be no more than six pages long.

In your discussion of the key design decisions, their justifications (and whether they were ultimately successful) you are encouraged to discuss alternative designs you could have followed.

Also note that it is valid to have made a decision at one point with what was at the time appropriate justification, only to discover it did not work out. This is reasonable to discuss in this report, and as long as you can justify the initial decision, you will also receive credit for consideration of why it ultimately failed.

Finally, critique the development process that your team followed, and the technologies employed. This last part specifically references D3.

7.1 Grade

You will be awarded an individual overall letter grade for the final report, in line with the grade descriptions stated in the Assessment Handbook (available via the University website).

While there is no prescribed marking scheme, it is reasonable to assume that the design decision discussions themselves are roughly 75% of the overall worth for this assessment item, while the process/technology critique is worth the remaining 25% (approximately).

8 Submission

It is important to follow these submission guidelines. Failure to do so may require re-submission, and the application of penalties if re-submission occurs after the official deadline.

Please note that extensions can only be given for medical emergencies, and that some form of evidence is normally required. Extensions must be arranged before the relevant deadline.

There are two separate submission deadlines for this project.

In accordance with the course outline, assessment that is submitted late will incur a one grade point penalty on the assessment item for each day that the assessment is late.

1. You need to submit your presentation slides and materials by 10:00am on Tuesday, June 2nd. The presentations will be after this time, but during the same final week.
2. You need to submit a final report (and the visualisation system itself) by Friday, June 26th at 23:59.

Please note:

- All submissions should be via the online submission system.
- All reports should be submitted as PDF files, with no whitespace in the filename.
- All presentations should be submitted as either PPTX or PDF. PDF files will need to be in handout form with the presenter notes showing.

9 Questions

I strongly encourage you to direct all general questions to the class forum. Similarly, you should monitor the class forum for answers, as any clarifications will apply to all students irrespective of whether you chose to read it or not.