DATA VISUALISATION 1

Semester 2, 2023, version 1.1

Version history:

- 1.0 (28 July 2023): Initial release
- 1.1 (30 July 2023): Update proposal submission date in task description section

Submission

Three submissions are required for this assignment:

1. Proposal: Brainstorm your project topic and find a suitable dataset. Then, submit a proposal by **Sunday 6 August 11:55 PM**. Discuss your visualisation project proposal with your tutor in the week 3 studio. The proposal is not marked, but is a hurdle requirement for this assignment.

2. Five Design Sheets: Show your sheets to your tutor in the **week 5 studio**. In the studio, your tutor will provide feedback.

3. Visualisation and report: due 3 September (Sunday of week 6), at 11:55 pm.

The submission of a report through the unit website is required. In addition, **publish your visualisation with Tableau Public and include the URL on the coversheet of your report**.

Introduction

In this assignment you design and build an effective visualisation for data of a specific domain. This will require you to critically evaluate information in a domain of your choice and develop your own visualisation. The domain can be broad or specific depending on the availability of datasets and your interest. If you have difficulty finding an interesting dataset or domain, have a look at https://www.kaggle.com/datasets.

The aim of the assignment is to apply the data visualisation techniques examined during the first 6 weeks of the semester and demonstrate their use in an innovative context. As such, the visualisation should satisfy the following:

- Why? It should address a particular need within a specific domain of your choosing. It must be targeted to the domain, its needs, and its users. This does not mean the visualisation has to solve an existing problem, but it must be a visualisation that is useful or relevant to people with an interest in the chosen domain.
- What? It should use a data source relevant to the domain. Data can be of any kind.

- Who? Design your visualisation for the average Australian or Malaysian.
- The visualisation must turn data into something meaningful and provide insight that would otherwise be difficult to obtain without the visualisation.
- It must provide interactive exploration.
- It needs to show some innovation. It does not have to be wholly original but cannot be a replica of a visualisation that already exists. It could be an innovative visualisation idiom, or an innovative exploration of an interesting dataset.
- It must demonstrate the use of the Five Design Sheet methodology for sketching and planning the design of your visualisation.
- It must demonstrate the use of the Munzer What/Why/How framework discussed in lectures for correctly assessing the type of data, the goals of the visualisation and the design of the visualisation.
- It must apply design principles discussed throughout the unit, such as data-ink ratio, storytelling, layout, typography and visualisation idioms with appropriate use of marks and channels.

Task Description

1. Choose a **domain** that you would like to explore.
2. Find relevant **datasets** that are publicly available.
3. Prepare a **proposal** with a summary of your domain, dataset, and possible design ideas and submit it to Moodle **by the end of Week 2**. Then, present your proposal to your tutor to **obtain approval in the Week 3 studio**. You may make amendments to your proposal after discussion with your tutor, and the proposal serves as a record of what has been agreed with your tutor. The approval and proposal are not marked, but they are a **hurdle requirement** for this assignment: You must obtain formal approval from your tutor before submitting the report.
4. Design a narrative visualisation using the **5 Design Sheet Methodology** using analogue pen and paper. Sketches designed with tablet apps or other digital tools are not accepted. Discuss your five design sheets with your tutor in the week 5 studios. Failing to do so will result in 0 marks for the five design sheets.
5. Implement your design with **Tableau**
6. Write a concise **report with a maximum length of 1000 words** (excluding the bibliographic list) covering the following:
   a. A title page including the number of words and a **URL** of your visualisation.
   b. A brief description of the **domain, Why** and **Who**.
   c. **What**: A brief description of the **data** (sources, authors, relevance, creation process, etc.).
   d. **Why and How**: Give a rationale for choosing the specific idioms and explain how they help the users to achieve their tasks. Include at least one screen capture of your entire visualisation, and a description of features that are special to your visualisation.
   e. **Design**: Briefly explain the rationale for your choices of
      i. Layout: How did you structure the layout in columns and rows?

ii. Colour: What are the reasons for selecting the specific colours of your visualisation, and how did you consistently apply the colours to charts, text, and figures?

iii. Figure-ground: How did you vary graphical elements to create a visual hierarchy?

iv. Typography: What are the reasons for selecting the specific typeface(s) and text layout?

v. Storytelling: How is the reader guided through the visualisation by using annotations and other means.

f. **Bibliography/list of references**.

Expectations

Format: The entire visualisation must be accessible through a single URL. The entire visualisation must be visible on a single web page that can be scrolled. There should be no buttons (or other web links) that swap the major section of the web page, but you can use buttons to show and hide visualisation elements.

Presentation not exploration: The goal of this assignment is to create a visualisation that communicates interesting information in an easily accessible and graphically engaging way using storytelling elements, layout principles, typography, and graphical design. The goal is not to create an expert tool for exploring and analysing a dataset.

Quality not quantity: Your visualisation will likely contain between 3 and 10 charts or diagrams that you create. There is no minimum or maximum number of charts. Instead, we are looking for carefully designed and annotated charts that – in combination with text, icons and pictures – guide the user through an interesting story using layout principles, typography and graphic design principles. Avoid pixelated images, non-informative graphical elements, or trivial text. Complement your visualisation with concise, informative and grammatically correct text.

Interactivity: Interactive features are easy to add in Tableau. Integrate interactivity where it makes sense, but do not just add interactive elements for their own sake.

Maps: Geographic maps will be required for the second visualisation assignment. For this first visualisation assignment, it is recommended to use non-geographic idioms; geographic maps will be ignored when marking your submission.

Copyright: You are encouraged to use icons and other simple graphical elements where appropriate. When using such elements, it is your responsibility to ensure you have the right to use them. Consult with your tutor if in doubt. You need to indicate the source and URL (if available online) in your report of any external element that you use, such as datasets, photos and sources of other information. There is no need to indicate the source and URL for simple icons (emojis, flags, trademark icons, etc.).

Authorship: Because your visualisation is publicly accessible, you should indicate your authorship and the license under which you make your work accessible.

Plagiarism: We will follow up on any kind of academic misconduct. For this assignment, you cannot integrate non-trivial graphics (such as diagrams, charts, information graphics, etc.) created by others.

Report content: The report must not include an introduction to the visualisation topic or extra information about the topic. The visualisation itself needs to tell the entire story. There is no need to include a table of contents or a conclusion in the report.

References in the report: Your report must include properly formatted references to the datasets, sources of information that you used to create your visualisation, possibly similar visualisation in the same domain, and photos, schemas, etc.) that you include in your visualisation. Your text needs to include in-text citations, and your report needs to contain a list of bibliographic references. The referencing style in this course is APA 6th [link], which is the recommended style for undergraduate students in the Faculty of Information Technology. Note that every in-text reference needs to be listed in the bibliographic list, and every entry in the bibliographic list needs to be referenced in the text.

Figures in report: Figures need to be numbered and referenced in the text with the figure number. Every figure needs to have a caption.

Marking

This assignment is worth 25% of the final unit mark. A detailed marking rubric is on the next page. If the report does not include a working URL to your visualisation the *Visualisation a, b* and *c* (see rubric) are marked with 0.

Late penalty:

- **10% per day and a one-week cut-off for the visualisation and report.**
- **2 marks for late submission of the five design sheets (due in week 5 studio).**

	HD (80–100)	D (70–79)	C (60–69)	P (50–59)	N (0–49)
5 Design Sheet 2%, 0 if created with digital tools or not presented in W5 studio.	All 5 stages completed, large variety of detailed sketches, creative and useful outcome.	All major stages completed, large variety of sketches, useful outcome.	All major stages completed, some variety of sketches, some useful outcome.	Not all stages completed, limited variety of sketches, limited outcome.	Incomplete, small variety of sketches, outcome not applicable.
Visualisation (a) Idioms and complexity 10%	A substantial number of appropriate standard and creative custom-built idioms. Demonstrate a high-level of understanding of the use of visual marks and channels.	A substantial number of appropriate idioms. Demonstrate a good understanding of the use of visual marks and channels.	Standard idioms (e.g., bar chart, line graph). Visual marks and channels are applied correctly.	A small number of standard idioms (e.g., bar chart, line graph). Slightly incorrect use of visual marks and channels resulting in difficult to read visualisation.	Inappropriate idioms, small number of standard idioms, incomplete visualisation. Visual marks and channels not applied correctly (e.g., hue channel for ordered attribute).
Visualisation (b) Layout, colour, figure-ground 4%	Balanced and symmetric layout clearly structured in columns/rows with good use of white space. All elements aligned with sight lines. Very clear visual hierarchy by using consistent colour and figure-ground.	Balanced and symmetric layout mostly structured in columns/rows with use of white space. Most elements aligned with sight lines. Visual hierarchy by using colour and figure-ground.	Somewhat balanced and symmetric layout not consistently structured in columns/rows. Arbitrary use of white space. Some elements aligned with sight lines. Some visual hierarchy.	Layout not balanced or not symmetric, no apparent layout structure. Some elements aligned with sight lines. Limited visual hierarchy.	Layout not balanced and not symmetric, no apparent layout structure. Most elements randomly placed. No visual hierarchy by using colour and figure-ground.
Visualisation (c) Typography, storytelling, annotations 5%	Advanced typography, (non-standard typeface matching the visualisation topic, very good readability of main text, appropriate line height, size, weight, colour, line length, alignment, and spacing of text elements). Clear guidance of the reader through visualisation. Extensive use of high-quality annotations on diagrams and text outside of diagrams.	Consistent typography (standard typeface and attention to typography). Guidance of reader through visualisation. Use of high-quality annotations on diagrams and text outside of diagrams.	Standard typography with minor issues, but still easy to read. Some guidance of reader through visualisation. Use of annotations on diagrams and text outside of diagrams.	Typography with some issues that impact readability of text (e.g., overuse of highlighting, poor or inconsistent spacing of text, centred text blocks, etc.). Limited guidance of reader through visualisation. Limited number of annotations on diagrams and text outside of diagrams with some grammar or content issues.	Inconsistency in fonts, sizes and weights. Typography resulting in poor readability (e.g., inappropriate typeface, poor font size, weight, line lengths, etc.) No guidance of reader through visualisation. Small number of annotations on diagrams and text outside of diagrams with grammar or content issues.
Report (a) Content 2%	Why, who, what, how, design are appropriately and succinctly described.	Why, who, what, how, design are described with some minor issues.	Why, who, what, how, design are described with some major issues.	Why, who, what, how, design are partially described.	Substantial aspects of Why, who, what, how, design are missing.
Report (b) Report structure, writing, figures, and references 2%	Clear structure. Correct grammar. Writing is easy to follow and understand. Figures carefully designed, with numbered captions, and referenced in text. Correct and well-formatted references are included.	Clear structure. Correct grammar. Writing is mostly easy to follow and understand. Figures carefully designed, with numbered captions, and referenced in text. References are included with some minor format issues.	Mostly clear structure, some content is misaligned. Some grammar issues. Writing is not always easy to follow and understand. Figures without numbered captions or not referenced in text. References have major format issues.	Structure not clear, some content is misaligned. Grammar issues throughout. Writing is not easy to follow and understand. Figures without numbered captions or not referenced in text. Critical references are missing.	Confusing structure. Major grammar issues throughout. Writing is difficult to follow and understand. Lack of figures. No references included.

Responsible use of AI technologies

Generative AI tools can be used for all assessments in this unit. In this unit, you can use generative artificial intelligence (AI) to assist you in any way. Any use of generative AI must be appropriately acknowledged ([see Learn HQ](#)).