Coursework 1: Information Visualization

KEY INFORMATION

- Teams of 3
- Individual: 2 designs and report + 1 peer feedback. In teams: integrated design and report
- **Due at 11:00 AM on Friday 8 March 2024**
- Feedback at 11 AM on Friday 29 March 2024
- Coursework 1 is worth 20% of the CSC337/CSCM37 module

GOAL

Create visualizations to reveal insights based on the data from a dataset.

LEARNING OBJECTIVES

- Analyze abstract visualization tasks.
- Choose and justify visual encoding for visualization tasks.
- Create visualizations with visualization tools.

TASKS

Teaming up:

Establish:

- a team communication method (chat group, exchange phone numbers)
- shared meeting note (e.g., a Google Doc) and workspace (e.g., Google Drive)
- one person as the team coordinator
- communication expectation: how fast should replies be expected
- shared free slots on the schedule that could be booked for team meetings or co-working

Note: See further tips for teamwork and meeting in the appendix.

Phase A: Individual design. Suggested finish date: **25 February**.

1. Find a dataset in Data Is Plural archive, Kaggle[2], or other sources (raw data source will need to be provided as part of the assignment deliverable in the submission). **All members of the team should use the same data.**
2. Produce **two different** visualizations that can convey meaningful and interesting insights about the data. **At least one of the visualizations** must be beyond bar charts, scatterplots, and line charts. There is no need for all team members to use the same vis tool in this phase.

[2] https://docs.google.com/spreadsheets/d/1wZhPLMCHKJvwOkP4juclhjFgqIY8fQFMemwKL2c64vk/edit#gid=0
https://www.kaggle.com/datasets?tags=13208-Data+Visualization

1. For **master students (CSCM37), at least one the visualizations** must be done with a coding-based vis tool (see list of eligible vis tools further below). It is important that you include a README.md(or README.txt) file with instructions on how to make the code run.

3. Write a max. one-page report with the following sections:
   - **Goal(s):** What do you want to learn from the visualization?
   - **Image of the visualization:** Ideally, it should be apparent
   - **Insight:** What is the answer or insights you discovered with respect to the goal(s)?
   - **Data Abstraction:** Describe how you map the (preprocessed) data to the abstract *dataset types* and *data types*. The data abstraction could be the same for all three vis or different if you derive some data prior to visualization. (See Chapter 2 of Munzner's book, and week 1 of the lecture.)
   - **Task Abstraction:** Describe how you map the goal or task that you describe above to the *abstract tasks*. (See Chapter 3 of Munzner's book, and week 2 of the lecture.)
   - **Data source(s):** Provide the URL of the data source(s) with a description of how the data is organized in the source.

4. Save your report in PDF in addition to its original format.

Phase B: Individual peer feedback. Suggested finish date: **1 March**.

1. Circulate the report to all team members on the same date. At this stage, you may circulate the report in its source file (MS Word, Google Doc, or etc.) to make commenting easy.
2. Pick **one design from each team member**. The design you choose should be different from your work, if possible.
3. Rate the design with the section "Individual: Visualizations and Report" of the grading rubric.
4. Additionally, add comments on the report to highlight both positive aspects and potential improvements.
5. Save the feedback and comment in PDF. Each student should have two PDF files from the other two team members. Each PDF must contain the original report with comments and the rubric table with ratings.

Note: There is no need to improve an individual's work based on the peer feedback. Instead, carry over the lessons learned to the team integration in the next phase.

Phase C: Team integration. Coursework deadline: **8 March 11:00 AM**

2. Agree on the vis tool of your choice to implement the integrated work.
3. Create a vis that could be based on some of the previously created individual vis, or it could be entirely new. However, their use must be justified with respect to the data and task abstraction.
4. Write a max. 1.5-page report (in PDF) with the following sections:
   - **Goals:** The integrated visualization must aim to support multiple goals.
   - **Image of the visualization, Insight**, **Data Abstraction**, and **Task Abstraction**
   - **Encoding:** Describe and justify your encoding choices.

5. Prepare the coursework submission package as shown in Figure 1. Submissions that are not organized according to the folder structure in Figure 1 will be penalized. See grading rubrics below.
6. Create a **.zip file**. Make sure extracting this zip file properly recreates this directory structure.
7. Upload the zip file to Canvas.

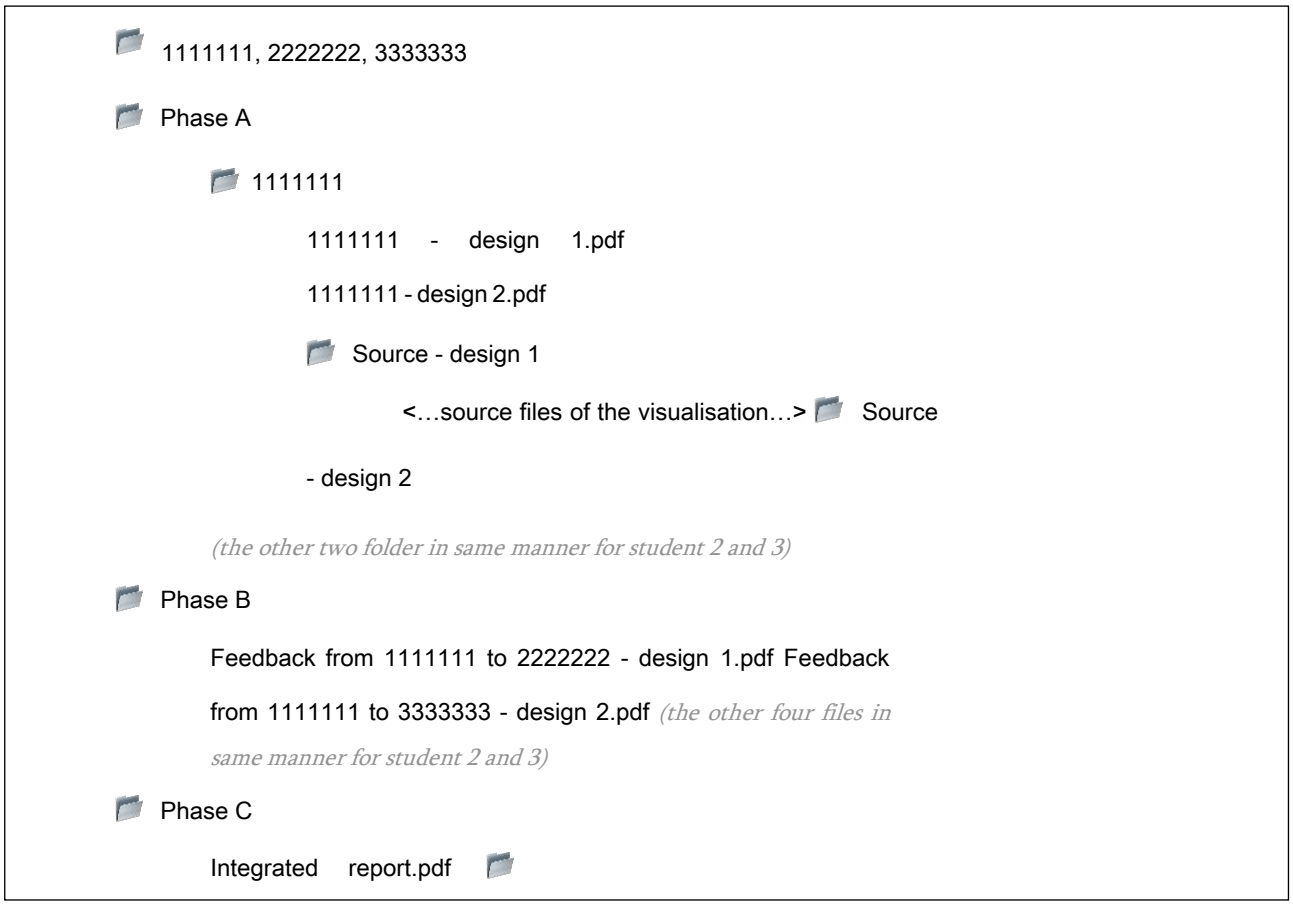

Figure 1. Example folder structure. (1111111, 2222222, 3333333 are example student numbers)

ELIGIBLE VIS TOOLS

Here is a list of visualization tools you may use for this assignment (you can use other tools, but check with Fernando first):

Non-coding based:

- Domo
- Power Bi
- Tableau
- Lyra

Coding-based:

- Vega-Lite (JS)
- Altair (Python)
- Vegalite (R)

GET HELP

You may ask questions at https://visguides.org/ if you need help with specific visualization techniques. For the administrative questions, post them on the Coursework 1 discussion board. You may also visit drop-in hours for interim feedback.

ACADEMIC MISCONDUCT

By submitting coursework, electronically and/or hardcopy, you state that you fully understand and are complying with the University's policy on Academic Integrity and Academic Misconduct. The policy can be found at https://myuni.swansea.ac.uk/academic-life/academic-misconduct. The consequences of committing academic misconduct can be extremely serious, and may have a profound effect on your results and/or further progression. The penalties range from a written reprimand to cancellation of all of your marks and withdrawal from the University.

GRADING RUBRICS

Coursework 1 is worth 20% of the CSC337/CSCM37 module. Submissions that are not organized according to the folder structure in Figure 1 will be penalized by 5% overall.

Overview	Weight
Individual: Visualizations and Report*	44%
Individual: Peer feedback	16%
Team: Integrated work (visualization and report)	40%
	100%

* For **master students** (CSCM37), at least one individual visualization must be done using code-based vis tools. Submissions with no runnable code will be capped at half the 'visualizations and report' mark at 22%.

Individual: Visualization and Report *(evaluated for each design) Use this part of the rubric to give feedback in Phase B.*

Weight	Criteria	Mark of 40%	Mark of 60%	Mark of 100%
2%	Goals and insights	Unclear description of the goals or insights. Lack of correspondence between both.	–	A clear description of goals and insights.
5%	Data abstraction	–	More than half of the description corresponds to the data and the vis.	The description completely corresponds to the data and the vis.
5%	Task abstraction	There is a correspondence between the task abstraction and the goals.	Task abstractions are described in detail with some flaws or misunderstandings of the task abstractions.	Task abstractions are described in detail, with high- and low- level tasks. No misunderstandings of task abstractions
10%	Image of the vis	The image is in an inadequate quality or crop area to show the vis.	The image is of appropriate quality, but it is unclear how the stated insights could be drawn from the vis	The image clearly shows the insights as described.
22% per vis. Totaling to **44%** overall				

Individual: Peer feedback *(evaluated overall)*

The absence of feedback receives a mark of 0%. If you did not give feedback to all some team members, the overall mark for this part will scale accordingly.

Weight	Criteria	Mark of 20%	Mark of 60%	Mark of 100%
5%	Specific	The location of that the feedback applies is vague, unclear, or ambiguous.	More than half of the feedback refers to specific aspects/parts of the visualization or report. But some feedback are unspecific.	All feedback refers to specific aspects/parts of the visualization or report.
8%	Application of the vis concepts	No vis concept used to justify the feedback.	Some vis concepts were used in the feedback, but there were misunderstandings.	Feedback heavily rely on vis concepts, and these concepts were used with the correct understanding.
3%	Constructive	The feedback has only negative tone.	There is a mix between constructive and purely negative tone.	The feedback points out both strengths and limitations of the work (wherever applicable).
16% overall				

Team: Integrated work

Weight	Criteria	Mark of 20%	Mark of 60%	Mark of 100%
3%	Goals and insights	See the criteria from the "Individual: Visualizations and Report" section.		
5%	Data abstraction			
7%	Task abstraction			
10%	Image of the vis			
5%	Encoding	Misunderstandings or ineffective use of encodings are prevalent	A clear description of visual encodings. But there are some misunderstandings or ineffective use of encodings.	A complete, clear, and correct description of visual encodings. Most encodings have high effectiveness and expressiveness. These choices are clearly justified
10%	Overall writing and formatting quality of the report	Many writing problems such that the report is difficult to understand.	Some misspellings and grammatical mistakes. The report has inconsistencies such that it is clearly written by multiple people.	Very few spelling and grammatical problems. The quality of the writing is consistent throughout.
40%	overall			

Appendix: Teamwork Guide

COORDINATOR ROLE

During the entire course of the coursework, there should be one team member who overlooks the planning and coordination of the assignment. This person ought to know the general status of the coursework, promotes communication among team members, and helps push the team work forward.

MEETING TIPS

1. Before each meeting, write a list of goals that is aimed to achieve in the meeting. This is the agenda.
2. Consider which participants are necessary to discuss each point. Not everyone has to be present in all meetings all the time.
3. Have a dedicated person to take notes for each meeting. Team members take turn to be the note-taker. When the note-taker speak, another member should help taking notes.
4. Note-taker summarize the points that were discussed, decisions that were made, and questions that still remain. No need to transcribe the meeting verbatim.
5. At the end of each meeting, there should be clear task assignment: who should do what, by when, what is the scope, and what are criteria for accomplishment.
6. In follow-up meetings, revisit the assigned tasks and update their status. When necessary, revise the scope and the deadline of the tasks that are carried over.

MEETING NOTES

Meeting notes serves several purposes:

- During the meeting, the notes represent the common understanding among the participants.
- After the meeting, the notes help the meeting participants to recall points discussed.
- Prior to subsequent meetings, a quick read of the notes from the previous meeting and the agenda of the upcoming meeting lets the participants mentally activate relevant information and physically prepare relevant materials in anticipation for the upcoming discussion.

To best serve these purposes we recommend the following:

1. Create a shared document with the newest meeting at the top (reverse chronological order).
2. In each entry, list who were present at the meeting and the date and time of the meeting.
3. During the meeting, ensure that all participants can see what is written in the notes in real-time. If there are ambiguities or misunderstanding, they can be immediately corrected.