1. Module number	SET0923
2. Module title	Interactive Data Visualisation
3. Module leader	Dr. Peter Chapman
4. Tutor with responsibility for this Assessment	Dr. Simon Wells
5. Assessment	Coursework 2
6. Weighting	60%
7. Size and/or time limits for assessment	Presentation: Maximum 10 minutes individual Demonstration Design Report: 5 page individual report
8. Deadline of submission	Due at 3:00PM on Friday 24th November 2023.
9. Arrangements for submission	• Code and Report should be submitted via Moodle • Presentation will be in person
10. Assessment Regulations	This assessment is subject to the University Regulations.
11. Requirements for the assessment	Please see attached descriptor for details
12. Special instructions	None
13. Return of work	We generally aim to return work with an uncomfirmed grade and summative feedback within three working weeks of the submission.
14. Assessment criteria	Please see attached marking criteria for details

Coursework #2

In this assessment you will take on the role of a Data Scientist who has been assigned to a project that aims to analyse weather data for marketing purposes. In particular, you have been asked to create an interactive visualisation dashboard that will allow you and your colleagues to explore this dataset and discover patterns.
In this second coursework, you will focus on creating the final visualisation dashboard, building upon, and extending the work from the first coursework.
This document describes the tasks to undertake in detail, along with requirements for the submission of the coursework, marking criteria, and finally, the data you are given to visualise. Please make sure to read it thoroughly, as failure to do so might see you losing marks.

Tasks

For this coursework, your first task is to set a general question about the dataset that your dashboard will help to answer. This can be supported by your initial exploration of the dataset made in the first coursework.

This coursework will involve three activities (your tasks):
1. Development
2. Design Report
3. Presentation

Development

First you should design and develop the visualisation dashboard. It can have as many charts as you see fit, but you are required to implement visualisations for two of the following types of data: temporal, geographical and hierarchical. The code and visualisation developed during the module's Practical Lab sessions should be your starting point, however, you are strongly invited to enhance these and/or implement new visualisations. Your choice of visualisation must be appropriate for the type of data presented.
Your dashboard must be interactive. The visualisation should implement cross-highlight and cross-selection interaction, meaning that it should be possible to interact with one visualisation to highlight elements or refine the data subset in another. You will have to decide which subsets of the dataset to represent. Your code must implement dynamic data operations to aggregate and/or filter the provided dataset and respond to user inputs.
With your visualisation and interaction design choices, you must also create and implement a dashboard design that serves your initial question about the dataset. The layout must fit in one full-screen browser window (~ 1900×900 pixels maximum). General UI and UX principles should be applied, and the layout should serve the interaction design.
The code submitted is expected to be ready to run in Google Chrome or Mozilla Firefox. No third-party library other than the ones provided should be used.
If part of your implementation is supported or inspired by external resources (e.g., online forums, documentation, tutorials) you should cite those in comments.

Design Report

Your second task will be to produce a report explaining your design decisions in the development of this dashboard. This should include the following parts:

1. The question you have set for the analysis of the dataset and motivation for the dashboard design.
2. The justification for your choice of visualisations.
3. The justification for your choice of interactions.
4. The justification for your choice of dashboard layout.

Your report must be maximum 5 A4 pages in length.

Presentation

Finally, you will be presenting your dashboard. This presentation should:

- Highlight the visualisations you have implemented, including the data they represent and the means of representation.
- Demonstrate the interactions available to the users and their effects on the dashboard.
- Present high-level insights about the data which result from the interaction and visualisation interpretation.

- Your presentation should take no longer than 10 minutes.

Submission Details

This coursework contributes to 60% of your overall module grade. This is an individual assessment. The work submitted should be entirely your own and will be checked for plagiarism. You will be penalised if Academic Misconduct is detected (see Academic Regulations).

Deliverables

- Your project should be submitted as a single .zip archive file, via the appropriate Moodle submission link.
- Your design report should be submitted as a .pdf document file, via the appropriate Moodle submission link.
- Your presentation will be in person.

Deadlines

Your submission is due:

Friday 24th November 2023 at 3PM on Moodle

Late submission (up to five days) will be capped to 40% of the assessment mark. Submissions over five days will get 0%. Standard Extenuating Circumstances Procedures apply.

Your presentation will take place on Tuesday 28th November in person in D10. Precise times and arrangements will be communicated to you via Moodle.

Grades & Feedback

Provisional grades and feedback will be provided on Moodle within 3 working weeks of the submission (before 15th December 2023).

Marking Criteria

Element	Criteria	Marks
Visualisations	• The cjoice of data representation is appropriate • The contextual information is clear • At least two visualisations represent either temporal, geographical, or hierarchical data	
Interaction	• The visualisations implement basic linked-highlight and selection interactions • The code implements dynamic data operations	
Dashboard	• The dashboard is contained in one page and follows basic UI/UX principles • The dashboard layout serves the interaction design	
Self study	• The code implements features or elements going beyond the taught material	
Code Quality	• The code is well structured and commented	
	Total marks available for Development	**65**
Design Report	• The report includes motivations for the design decisions • The choice of visualisations is justified • The choice of itneractions is justified • The choice of dashboard layout is justified • The report is clear and respects format contraints	
	Total marks available for Design Report	**20**
Presentation	• The visualisations are presented and explained • The available interactions are demonstrated • The presentation contains a brief description of insights from the data exploration • The presentation is clear and respects format constraints	
	Total marks available for Presentation	**15**
	Coursework Total	**100**

Data Description

The dataset in weather_data.csv consists of 3420 records made by weather stations across the UK. The data was download from the Met Office website:

https://www.metoffice.gov.uk/research/climate/maps-and-data/historic-station-data

Some stations had incomplete records for the date range used and were therefore excluded from this dataset.

Each station has several entries, corresponding to different years and months. Each entry has the following attributes, in order:

1. name – the station's name
2. lon – the station's longitude
3. lat – the station's latitude
4. region – the region in which the station is located: England S, England N, Wales, Northern Ireland and Scotland
5. year – the year of the record, from 2007 to 2021
6. month – the month of the record, from 1 to 12
7. max_temp – the average daily maximum temperature in degrees Celsius for the month of the record
8. min_temp – the average daily minimum temperature in degrees Celsius for the month of the record
9. af_days – the numbers of days of air frost for the month of the record
10. rain – the total rainfall in millimetres for the month of the record
11. sun – the total sunshine duration in hours for the month of the record