Arts Application Programming 2020/21: Coursework

The coursework is worth 60%. There are two submissions:

- **Design decisions (20 marks – 10%)**: submission deadline, 10 am, **Friday 30 October (week 6),** pdf/word file.
- **Final submission (80 marks – 50%)**: 10am, **Monday 30 November (week 11),** zip folder (including code, csv file, any image files and pdf/word file)

Electronic submissions to QMPlus (not email). Allow sufficient time to upload: submissions that are e.g. 1 second late are registered as one-day-late on the system and receive a 5% lateness penalty. Late submissions are given a 5% penalty per day. No work can be submitted more than 7 days after the coursework deadline. Note that work cannot be resubmitted after the coursework deadline, nor after marks are released.

Regulations: Students should read the student handbook to ensure they clearly understand what it meant by plagiarism, and possible penalties involved. This is an individual project and students are expected to present work that is clearly their own.

The aim of this coursework is to generate a visualisation of a dataset.
Students must use ONE of the datasets available on QMPlus (see week 4 block). Note the points about the following datasets:

- Festival headliners (select 1-5 of the festivals – if selecting >1 festival then e.g. match by dates)
- William Blake images (note that if only selecting line engravings then this feature cannot count as one of the 5 columns)
- Wimbledon winners (this will need converting to .csv, but it is currently available as an excel file as there is more than one tab to explore)

This site is helpful for exploring data stored in csv files: https://www.databasic.io/en/wtfcsv/

For all data:

- Your csv file MUST contain at least 20 rows (i.e. you do not have to use the entire CSV shown) – note that more interesting visualisations on this module usually show more rows than this, but 20 is the a minimum
- Your csv file MUST contain at least 5 columns (note for the festivals dataset this does not include the festival name unless you are using data from at least 3 of the festivals). Note that if all the data is the same for a column this cannot be included in the column count.
- All the data in your csv MUST be used in the visualisation (i.e. your visualisation must show at least 20 'items', e.g. Wimbledon winners, with 5 features for each item - you cannot use just one or two features of the data)
- Your visualisation must be able to show at least 20 individual items, i.e. rows from the csv, not only e.g. averages of these items
- Note that this data has to be read into your code, not written/hardcoded into your sketch

Submission #1: Design Decisions (20% of the coursework, 10% of the overall module)

Copy the following table into a word (or equivalent) file and fill in your answers. You need to carefully look at the data first to understand what it is showing, the data ranges etc. Then decide what the key story is, what you want users to see, how they might interact with your visualisation, how best to represent the data etc.
Save the file as a Word doc/docx, pages or pdf and submit to QMPlus

Part 1. State what dataset you will be using (provide a link or paste the data to the end of the file if you are not using one of the datasets from QMPlus). Note that you cannot change your choice of dataset after this submission.

Part 2: Observation & Analysis

- State your key observations about the data e.g. value ranges, correlations, averages AND HOW THIS IMPACTS VISUALISATION DECISIONS
- If you are not including the entire dataset justify your source of rows and columns
- Define a **numbered list of concrete goals for the visualisation – based on your key observations about this data – then address how you will address/meet each goal**.
  e.g. What patterns or relationships can be visualised? Why is it important to understand these patterns or relationships? How will you decide if your visualisation is successful? What should a user be able to do with the visualisation that they could not just by looking at the data in a table? Provide examples. where relevant, justify your choice of data from the full dataset

Do not discuss e.g. graphical forms and layout in this section (use section 3: Design)

[5 marks]

Part 3: Design

Based on the points in part 2, what kinds of visualisation technique are best suited to this dataset? Explain your design choices for mapping properties of the data to visual properties in your visualisation. Why did you adopt each choice over other possibilities that you considered? What interaction have you considered? Provide examples from the data that inform these decisions. Designs that do not use some values from the dataset will score low marks as the data has to inform your decisions.
What colours, shapes etc? every point in this part needs to be shown as a drawing
Note that the **maximum window size is 1200x800 pixels**, i.e. max `size(1200,800)`. You must NOT use `fullScreen()`
Provide drawings (not code at this stage). These should form the basis for writing your code

[15 marks]

Submission #2: Processing Coding Task
[80% of the coursework (50% of the overall module): 65 marks for code, 15 marks for evaluation]

Avoid using ready-baked code, i.e. solutions from the Processing or other websites. The aim of this assignment is to develop your coding skills, which you need throughout the degree, not to be good at copying other people's work. Any code copied from the Internet or other sources needs to clearly referenced, but higher scoring work will be unlikely to include code from other sources.
Likewise, do not use or develop solutions from students in higher years. Again, this doesn't help you solve problems.

1. Preparation & reading in the data
Download the data, select the cells you are interested in based on the guidelines above and save it as a csv file. Mac users may find it easier to save and use the CSV file in Excel rather than in Numbers. Do NOT sort the data before reading it into the sketch. You may be allowed to clean the data, e.g. if there are commas within a column, > signs etc. (check first with Karen) Each row should be an item (e.g. a country) and each column should represent a property of that item (e.g. size, population, GDP…).

Write code to read in the CSV file to extract the data, in an appropriate location in your code. You MUST use the data read in from the CSV – do NOT hardcode your data inside the sketch (otherwise you will also lose marks in the implementation section).

Note that marks are not explicitly allocated for this, but marks can be lost for this in the implementation section.

2. Implementation of visualisation.
Adapt your sketch to include a visualisation of the data properties, maximum window size 1200*800 pixels. This is the core part of the project and will be assessed on three criteria.

First, the **quality of the code**:

- elegance, e.g. avoiding repetition
- use of appropriate variable types and names
- use of appropriate data structures and e.g. use of loops, correct logic for conditionals etc.
- appropriate scope
- indentation of code
- use of comments – a useful test is "will you understand this code in 6 months' time?"
- not submitting code with huge sections commented out – submit a tidied final version

Higher marks will only be gained by ensuring that you do the following:

- **creating a class** to appropriately represent the data. The variables, constructor and methods you implement should be appropriate to your chosen data.
    - This class must do more than merely assign variables, i.e. it must have functions (not just getters/accessors)

    - Creating a button class does not count (partly as there are multiple solutions available online) – a class should be used to represent the data e.g. artwork, animal
    - You must both create and use related object/s of this class
    - **All classes must be written in a separate tab – not in the same page as e.g. setup and draw**
- writing (and using) your own **functions**

[40 marks]

Third, the **effectiveness of the visualisation in reaching the goals** identified in the design document you submitted earlier

- relationship to the goals and visuals in the design document
- are the intended properties of the data clearly visible?
- is the visualisation aesthetically pleasing?
- do the aesthetics add to or distract from the data (or not appear to bear any relationship to the data)?
- are all aspects of the dataset fully used (and not e.g. partially hardcoded)
- ambition including range of user interactions

[25 marks]

The sketches, the csv file and any e.g. image files must be submitted inside the Processing folder (i.e. a folder with the same name as the Processing sketch). **Failure to do so will lead to 5 marks being deducted.**

Before submitting ensure that your code can run:

- **without a user having to download specific typefaces/fonts**
- **without a user having to install a library or any other software**

Paste the table below into a document and answer the question then save as doc/docx, pages or pdf. Do not paste code as part of your answer

Critically evaluate your visualisation, partly with respect to the goals you identified in your design document (part 2). 1. What criticisms might be made – including, with hindsight, the goals you set – and what problems have you identified? 2. Include a critique of coding decisions, including possible ways to fix (do not provide code but state which code you would have to rewrite and how) 3. How could you improve your visualisation given more time and why (hint: do not focus on decoration)? Note that a critical evaluation is **not** a description of 'success' or a list of decisions, but is intended to identify weaknesses, partly to inform future work. Do not paste any code as part of your explanation 10 marks

The marking breakdown is an approximation but will be close to the final marking scheme.

For the final submission you need to put the Processing folder (this must have the same name as the Sketch) with all the code (plus the .csv file and any e.g. .jpg files you may be using) plus

the answers in the table (in a doc/pdf/pages file with your name, e.g. sasJones.pdf) into a .zip folder called e.g. sarahJones.zip (replacing sasJones with your name). *Submit your zip to QMPlus*

Submission Checklist:

- ☐ csv file is included in the correct location
- ☐ the code runs
- ☐ window size is no larger than 1200*900 pixels and does not use the `fullScreen()` function
- ☐ code is commented to add readability (explain purpose of variables, functions etc.)
- ☐ blocks of commented-out code have been deleted
- ☐ each class is located in a separate tab
- ☐ processing sketch and csv (plus e.g. image files) are inside a correctly names processing folder
- ☐ processing folder and the word/pdf/pages file are inside the .zip folder – double-check before submitting as if you forget to submit the evaluation file this means missing (max) 15 marks