**Assignment**

**World Covid-19 Visualization with Python and Tableau**

In this assignment, you will design and build a set of visualizations for a data set and provide a rigorous rationale for your visualisation choices. You should in theory be ready to explain the contribution of part in the display. The assignment includes two visualisation subtasks. First, you are advised in this assignment to use **Python** as the main visualisation language to design and plot the graphics or charts from the statistical data described below. Second, you should use **Tableau** to design and build an interactive dashboard showing the main statistics and visual reports extracted from the data set.

However, you may find it most instructive to use some other scripting or statistical tools to facilitate the visualisation process.

* **Data Set:** Global Coronavirus (COVID-19)

The official WHO (World Healthcare Organization) website for data and insights on coronavirus (COVID-19) provides an up-to-date and authoritative summary of key information about the COVID-19 pandemic. Found at: <https://covid19.who.int/>

The WHO coronavirus (COVID-19) dashboard presents official daily counts of COVID-19 cases, deaths and vaccine utilisation reported by countries, territories and areas. Through this dashboard, they aim to provide a frequently updated data visualization, data dissemination and data exploration resource, while linking users to other useful and informative resources. The dashboard meets a strong public need for timely updates at national and local level to ensure good understanding of the progress of the pandemic. This includes levels of infections, the impact on health in the world and on measures taken to respond.

**Data availability**

Different data is shown for:

* cases, testing and deaths data
* vaccinations

Dataset: WHO-COVID-19-global-data.csv and vaccination-data.csv (found in **data**)

Source: <https://covid19.who.int/data>

You should read the description of each field:

<https://covid19.who.int/data> 🡪 select **Data Download** 🡪 read tables: **Daily cases** and **Vaccination data**.

* **Your Tasks**

**Task 1:**

1. Start by choosing **5 questions** you'd like **5 visualisations** to answer.
2. Design and plot (in Python) a **static visualisation (i.e., a single plot)** that you believe effectively answers one of the questions and use the question as the title of your graphic.
3. Provide **a short write-up** (no more than **2 paragraphs**) describing your plot design and display.

While you must use the data sets given:

* You are free to transform the data as you see fit. Such transforms may include (but are not limited to) log transformation, computing percentages or averages, grouping elements into new categories, or removing unnecessary variables or records.
* Your chart image should be interpretable without recourse to your short write-up.
* Do not forget to include title, axis labels or legends as needed!
* As different visualisations can emphasize different aspects of a data set, you should document what aspects of the data you are attempting to most effectively communicate.

**Task 2:**

Create one dashboard in Tableau, containing at least **five visualisations**, to analyse and show:

* Daily cases
* Daily deaths
* Statistics using country
* Statistics using age and gender
* Accumulative statistics: sum, average, etc.

In your write-up:

* You should provide a rigorous rationale for your design decisions.
* Document the visual encodings you used and why they are appropriate for the data and your specific question.
* These decisions include the choice of visualization type, size, color, scale, and other visual elements, as well as the use of sorting or other data transformations. How do these decisions facilitate effective communication?
* **Grading Rubric**

The assignment score is out of a maximum of **100 points**. We will determine scores by judging both the soundness of your visualisation and dashboard designs and the quality of the write-up. We will also look for consideration of audience, message and intended task.

We will use the following rubric to grade your assignment. Note, rubric cells may not map exactly to specific point scores.

|  |  |  |  |
| --- | --- | --- | --- |
| **Component** | **Excellent** | **Satisfactory** | **Poor** |
| **Data Question** | An interesting question (i.e., one without an immediately obvious answer) is posed. The visualization provides a clear answer. | A reasonable question is posed, but it is unclear whether the visualization provides an answer to it. | Missing or unclear question posed of the data. |
| **Mark, Encoding, and Data Transforms** | All design choices are effective. The visualization can be read and understood effortlessly. | Design choices are largely effective, but minor errors hinder comprehension. | Ineffective mark, encoding, or data transformation choices are distracting or potentially misleading. |
| **Titles & Labels** | Titles and labels helpfully describe and contextualize the visualization. | Most necessary titles and labels are present, but they could provide more context. | Many titles or labels are missing, or do not provide human-understandable information. |
| **Design Rationale** | Well-crafted write-up provides reasoned justification for all design choices. | Most design decisions are described, but rationale could be explained at a greater level of detail. | Missing or incomplete. Several design choices are left unexplained. |
| **Creativity & Originality** | You exceeded the parameters of the assignment, with original insights or a particularly engaging design. | You met all the parameters of the assignment. | You met most of the parameters of the assignment. |

* **Submission Details**

This is an individual assignment. You may *not* work in groups. Your completed tasks are due as follows:

* **Task 1**: **Thu. 01/12/22, by noon**.
* **Task 2**: **Thu. 01/12/22, by noon**.

Submit your assignment on **Moodle**.

The submission form expects your visualizations to be as follows:

* **Task 1**: Submit your visual plots as images (either a .png or .jpg) with Python source code implemented to plot them. Please make sure your image is sized for a reasonable viewing experience; readers should not have to zoom or scroll in order to effectively view your submission!
* **Task 2**: Submit the Tableau Workbook within a zipped folder which contains the source files created to design and build your dashboard.