COVID-19 dashboard

The World Health Organization (WHO) has developed a dashboard that allows users to explore how the COVID-19 situation has developed around the world (see the dashboard here). You are asked to develop a Dash application that replicates some of the functionalities of the COVID-19 dashboard by the WHO.

Data

To create the application, you will use a data set from Our World In Data that records daily observations on COVID-19 for countries and regions around the world. The data set is updated daily and can be downloaded from this URL: https://covid.ourworldindata.org/data/owid-covid-data.csv. In case that the URL does not work, you can instead download the file from the course page in Canvas. You can also visit their GitHub page for more information regarding the data set.

For the application, you will use data on the development of COVID-19 cases, deaths and vaccinations. Please import the following columns from the data set:

`iso_code`	ISO3 country identifier.
`location`	Country/region name.
`continent`	Name of continent that country/region is located in.
`date`	Date of observation.
`new_cases`	New confirmed cases of COVID-19.

`total_cases`	Total confirmed cases of COVID-19.
`total_cases_per_million`	Total confirmed cases of COVID-19 per 1,000,000 people.
`new_deaths`	New deaths attributed to COVID-19.
`total_deaths`	Total deaths attributed to COVID-19.
`total_deaths_per_million`	Total deaths attributed to COVID-19 per 1,000,000 people.
`new_vaccinations`	New COVID-19 vaccination doses administered.
`people_fully_vaccinated`	Total number of people who received all doses prescribed by the initial vaccination protocol.
`total_vaccinations_per_hundred`	Total number of COVID-19 vaccination doses administered per 100 people in the total population.
`people_vaccinated_per_hundred`	Total number of people who received at least one vaccine dose per 100 people in the total population.

You should spend some time exploring the DataFrame to make sure that you have imported the data correctly and that you understand the different columns in the data set.

Application

There are three main features of the COVID-19 dashboard developed by the WHO that your Dash application should replicate:

1. Display the current number of total deaths, total cases and people that are fully vaccinated in the world.
2. Display a world map that shows the number of deaths, cases and vaccinations for each country in the data set.
3. Display a bar plot that shows the global number of new deaths, cases and vaccinations for each *week* in the data set.

Feature number 1:

This is a static (i.e. non-interactive) feature that simply states the accumulated number of deaths, cases and people that are fully vaccinated in the world up to the current date.

Feature number 2:

This should be an *interactive* feature that depends on two selectors. The first selector is the *variable*, and the user should be able to select between the following variables:

- Deaths
- Cases
- Vaccinations

The second selector is the *metric*, which should depend on the chosen variable. If the user has chosen “Deaths” or “Cases”, then the available metrics should be:

- Total
- Total per 1 million population
- Newley reported in the last 24 hours

However, if the user has selected “Vaccinations”, then the available metrics should be:

- Total doses administered per 100 population
- Persons vaccinated with at least one dose per 100 population
- Persons fully vaccinated with last dose of primary series

Feature number 3:

This feature should also be an interactive feature, but it should only depend on the chosen variable. When the user selects one of the available variables (“Deaths”, “Cases” and “Vaccinations”), the bar plot should display the global number of new occurrences for that variable in each week of the data set.

App layout:

Your application can use a similar layout as the one in the COVID-19 dashboard by the WHO, or you can choose a different layout. However, please keep in mind that your submission will be graded by the level of complexity of the layout in your application.

Assessment of submission

Your submission will be graded according to the following criteria:

- A .zip file that contains a Jupyter Notebook (.ipynb) with well-documented code (e.g. Markdown cells, in-line comments) (10 pts max)
- A working Dash application with:
    - Feature number 1 (10 pts max)
    - Feature number 2 (30 pts max)
    - Feature number 3 (20 pts max)
- Efficiency of the code – good use of control structures (e.g. loops, if-statements) and functions to reduce code duplication and handle errors/exceptions (15 pts max)
- Complexity of the application layout – good use of Dash components (e.g. cards, rows and columns) to organize and structure the content in the application (15 pts max)

Notice that the points at the end of each element in the list are the maximum scores attainable, and the final score will depend on the assessment of each element. This means that just the existence of the element in the submission will not automatically ensure the maximum score.