Introduction to Dashboard Tools: Practical Instructions

Aims

The purpose of this practical is to ensure you have the necessary knowledge to begin your CW2 dashboard project and to provide an important hands-on experience for creating a simple dashboard.

The code presented here is just a starting point. Feel free to explore and augment code by using appropriate online helpers and tools. The more you experiment, the more you will be able to learn.

Set up

Ensure you have the following software installed on your laptops:

Visual Studio Code <https://code.visualstudio.com/>

Ensure you have python installed in addition to the Anaconda python interpreter. Jupyter Notebooks are supported natively by Visual Studio Code. Follow these tutorials to find out more:

* <https://code.visualstudio.com/docs/python/python-tutorial> and
* <https://code.visualstudio.com/docs/datascience/jupyter-notebooks>

If you have difficulties, you can use <https://pythontutor.com/python-compiler.html#mode=edit> to create python. This however will not allow you to create a Jupyter Notebook which you will need for your coursework 2 submission.

Overview

The steps below are going to take you through creating a Jupyter Notebook that will pull in the appropriate python libraries, load data from a spreadsheet and then display a web page showing two columns of data.

The libraries are a selection of important data science libraries and dash, an open-source framework that allows you to build data visualisation web applications.

The dash framework uses HTML to format the page and display it in a browser. In this example we are going to use the traditional bootstrap style of formatting for our columns. Bootstrap is a well-established library for laying out web pages and it uses a 12 x 12 grid system for layout. If you are interested in learning more take a look here <https://www.w3schools.com/bootstrap/>. However, this is not essential for this module.

Use the accompanying ipynb to copy code into your own dashboard. When copying the code across reflect on what the code is doing and look up anything you are unsure of.

Steps

1. Check you have the following libraries installed:
   1. Dash
   2. Pandas
   3. Plotly
      1. If they are not installed, open a terminal and type in the following:

!pip install dash pandas plotly

1. Check your Visual Studio Code set up
   1. To work effectively in Visual Studio Code you need to have the following installed already. Install them if you have not been able to do this.
      1. Install the Python extension for VS Code from the Visual Studio Marketplace. It is published by Microsoft. (<https://marketplace.visualstudio.com/items?itemName=ms-python.python>)
2. Using your file explorer on your device create a folder where you are going to place your code for this exercise and save the provided dataanalysis.csv file in it.
   1. Placing it in a hierarchy in One Drive is recommended. My example would be my “Code” folder within the week for the module - as follows.

A screenshot of a computer

Description automatically generated

1. In the explorer pane (or in the terminal if you are confident) open the folder you have just created and create a new Jupyter Notebook.
2. **Now make sure you have the tutorial example Jupyter notebook [TutorialDashboard.ipynb] open so that you can copy the python code into your Notebook**. In your newly created Jupyter Notebook, ensure there is a python code cell at the top and enter the python to make the following happen:
   1. Import the libraries Dash, dash\_bootstrap\_components, plotly.express and pandas.
   2. Read the dataanalysis.csv file into memory using the Pandas library.
   3. Use the plotly.express function for creating a choropleth map to show the unemployment rate per country.
      1. You can find out more about this function here <https://plotly.com/python/choropleth-maps/>
   4. Use the plotly.express function for creating a line graph to show the unemployment rate per country. Given there are many countries, filter the data so that you only show three countries.
   5. Create two cards for displaying the map and the line graph you created in 5.3 and 5.4. Consider the use of colour for cards.
      1. You can find out more about dash bootstrap components here <https://dash-bootstrap-components.opensource.faculty.ai/docs/components/card/>
   6. Finally create the dash app to show the two cards side by side.
3. Make sure you debug and reflect as you copy the code across.