JavaScript Programming Assignment

This assessment is worth 10% of your final mark.

You are working on a project to help the mayor understand the existing infrastructure for electric vehicles in your city.

The electric charging stations are owned by another company, which isn't willing to share all of its data with you as an external partner. However, they are happy to run the code you send and return the output to you!

Please print all of your output to the console.

1. Output the string "Setup"

   Create an object called `ChargingStation` which has the following attributes:
   - **ID**: an alphanumeric string identifying the charging station (e.g. "AB3456")
   - **capacity**: a whole number dictating the number of vehicles which can charge at the same time (e.g. 3)
   - **parkingfee**: a True/False value indicating whether the user must pay for parking (e.g. True)
   - **socket**: an array of strings listing the types of plugs available at this point (e.g. ["type2", "tesla_standard", "chademo"]
   - **coordinate_x**: a decimal number giving the GPS x coordinate (e.g. 51.3456)
   - **coordinate_y**: a decimal number giving the GPS y coordinate (e.g. 0.23957)

   The external company will create a number of new `ChargingStation` objects and store them in an array called `stations`.

2. Output the string "Locations of Free Parking"

   Create a function which takes as input the array `stations` and prints out the ID and coordinates of every charging station for which parking is free. If there are no free charging stations, do not print anything.

3. Output the string "Geographic Extent"

   For your report, you need to know the maximum geographic extent of the charging stations. Create a function which takes as input the array `stations` and prints out the maximum and minimum values of both the X and Y values. If there are no charging stations in the list, print "Error - no area defined".

4. Output the string "Exploring Capacity"

What is the total capacity of the entire city? Create a function which takes `stations` as input and prints out the sum of all of the capacities of all of the charging stations.

5. Output the string "An applied case:"

The mayor is thinking of buying a vehicle herself, to set a good example. She would like to see how widespread support for her vehicle would be. Create a function which, when it is passed the array `stations`, outputs an array of all of the stations which have the socket "chademo" in their list of supported sockets. Take the resulting array and pass it to the function to calculate the geographic extent of the set of "chademo" charging points.
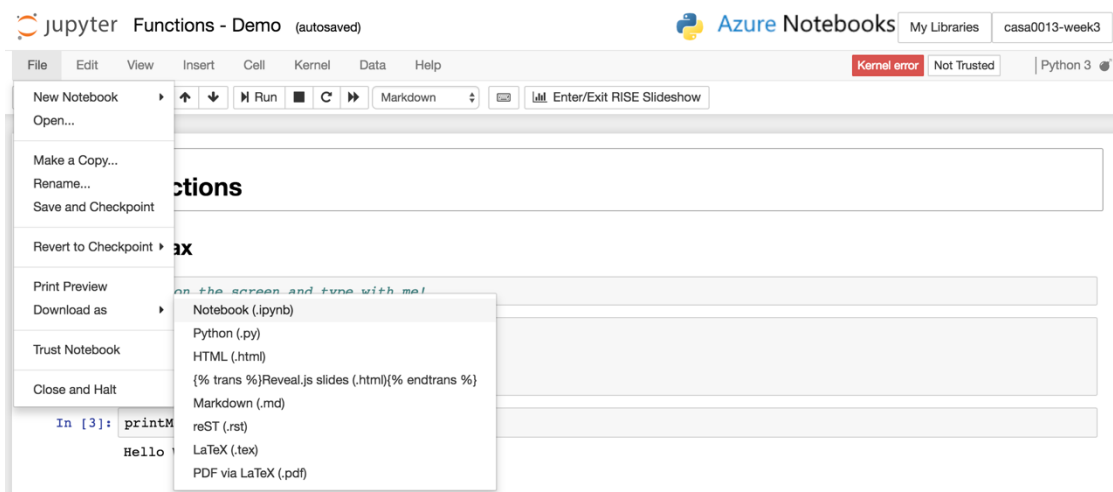
Remember:
the user may give input which is unreasonable. Be cautious of this, and plan around it!

Assignment submission

1. Please complete your assignment as an Azure notebook.

2. Once you are ready to submit, download the notebook as a Jupyter notebook by clicking

File → Download as → Notebook (.ipynb)

3. Name the notebook assignment2_yourID.ipynb (e.g. assignment2_uceswis.ipynb) and submit it on Moodle.