MSc Artificial Intelligence Python Primer

Unit 8 Worksheet

**Aims and Objectives**

1. Learn about Simple Line Plots, Scatterplots, Histograms using Matplotlib
2. Learn about subplots, 3-D plots and density/contour plots
3. Learn about customising plots and adding annotations
4. Learn about Seaborn

**Introductory Tasks**

* Download the ***Unit 8 Jupyter Notebook*** to your local drive. The Notebook can be found on Blackboard (in Python Primer >> Unit 8 – Introduction to Matplotlib and Seaborn)
  + Once you have downloaded this Notebook, open the *Anaconda Navigator* and launch the *Jupyter Notebook* application and open the downloaded Notebook file
  + There are exercises for you to complete throughout the Notebook. These are clearly marked Worksheet Exercises
* The following online guide to Seaborn provides a much richer introduction to this useful extension to Matplotlib than has been included in this unit’s Jupyter Notebook: <https://www.datacamp.com/community/tutorials/seaborn-python-tutorial>
  + Take a look at this guide to help supplement your understanding of this unit’s Jupyter Notebook

**Optional Extra Tasks**

* Look for other graphics libraries that could be used for visualisations such as
  + Plotly
  + ggplot
  + Bokeh
* Identify other plot options that are available in matplotlib and seaborn such as
  + Bar / Pie Charts
  + Box / Violin / Swarm / Polar Plots
  + Heatmap
  + Clustermap
* Review the module reading list for other sources of information to supplement your understanding of the Pandas library.

**Advanced Tasks**

* Pandas provides some more advanced functionality. A second Jupyter Notebook (***Unit 8 Advanced Matplotlib***) has been created which contains more instruction on this extra functionality. NOTE: there are no Worksheet Exercises included in this NoteBook.
  + In particular, the following elements are covered:
    - Customising Ticks and Colorbars
    - Configurations and Stylesheets

**Assessment Details**

* There are no formatively assessed exercises in ***Unit 8 Jupyter Notebook***

**Useful Links and Resources**

* Matplotlib Online Documentation: <https://matplotlib.org/>
* Annotation Demos: <https://matplotlib.org/2.0.2/examples/pylab_examples/annotation_demo2.html>
* Matplotlib Basemap Toolkit documentation: <https://matplotlib.org/basemap/>
* Seaborn Online Documentation: <https://seaborn.pydata.org/>
* Seaborn Tutorials: <https://www.datacamp.com/community/tutorials/seaborn-python-tutorial> & <http://seaborn.pydata.org/tutorial.html>
* Ten Simple Rules for Better Figures Article: <https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1003833>
* Bokeh Online Documentation: <http://bokeh.pydata.org>
* Plotly Online Documentation: <http://plot.ly>
* ggplot Documentation: <https://ggplot2.tidyverse.org/reference/ggplot.html>