MSc Artificial Intelligence Python Primer

Unit 1 Worksheet

**Aims and Objectives**

1. Learn how to create variables in Python
2. Learn about the different types of data that can be stored in variables
3. Learn about strings and how they can be format constructed and formatted
4. Learn how to convert mathematical expressions into Python code

**Introductory Tasks**

* Download the ***Unit 1 Jupyter Notebook*** to your local drive. The Notebook can be found on Blackboard (in Python Primer >> Unit 1 – Python Variables)
  + 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
* Read the following three chapters of the ***Beginners Guide to Python 3 Programming*** core text-book:
  + A First Python Program
  + Python Strings
  + Numbers, Booleans and None

NOTE: .pdf versions of these chapters can be found on Blackboard (in Python Primer >> Unit 1 – Python Variables)

**Optional Extra Tasks**

* In the ***Unit 1 Jupyter Notebook***, we only take an introductory look at the *string* datatype. The *string* object has many methods available. The following list of tutorials provide a more in-depth introduction to strings:
  + General tutorial: <https://www.datacamp.com/community/tutorials/python-string-tutorial>
  + The *string.format()* method - <https://realpython.com/python-formatted-output/>
  + String slicing: <https://www.digitalocean.com/community/tutorials/how-to-index-and-slice-strings-in-python-3>
* Review the module [reading list](https://rl.talis.com/3/uwe/lists/8F4FE1D0-B17E-6FE7-5C9E-B5ACE8A689AE.html) for other sources of information to supplement your understanding of variables and data types.
* Look at how the Jupyter Markdown language works and experiment with creating Markdown cells. You will need to know how to do this for your coursework. (see <https://www.datacamp.com/community/tutorials/markdown-in-jupyter-notebook>)

**Advanced Tasks**

* One of the exercises embedded within the ***Unit 1 Jupyter Notebook*** asks you to make use of the Python math library.
  + Try looking at the documentation for this library at: <https://docs.python.org/3/library/math.html>
  + Experiment with some of the other methods available in this library
* Jupyter Notebooks provides Markdown for displaying mathematical equations. The following article explains how: <https://medium.com/analytics-vidhya/writing-math-equations-in-jupyter-notebook-a-naive-introduction-a5ce87b9a214>

**Assessment Details**

* In the ***Unit 1 Jupyter Notebook***, you will see several exercises that are written in ***bold italic*** type. These exercises are to be formatively assessed by the module team.
* In fact, the following units have assessed exercises embedded within them: 1-3 & 5-6
* Exercises are worth 2, 3 or 4 marks. There are 50 marks available for all assessed exercises.
* You are expected to provide solutions to these exercises in the **Python\_Primer\_Submission** **Jupyter Notebook** (available on Blackboard in the Python Primer folder)
* Once completed you should submit this Jupyter Notebook to the Blackboard link provided in the Python Primer folder on Blackboard
* The module team will mark your solutions at regular intervals during the first two weeks of term.

**Useful Links and Resources**

* Python Data Types: <https://docs.python.org/3/library/stdtypes.html>
* Python Strings API: <https://docs.python.org/3/library/string.html>
* Python Math Library: <https://docs.python.org/3/library/math.html>
* Python Math Library for Complex Numbers: <https://docs.python.org/3/library/cmath.html>
* General Python String tutorial: <https://www.datacamp.com/community/tutorials/python-string-tutorial>
* Using the string format() method: <https://realpython.com/python-formatted-output/>
* How to slice strings in Python: <https://www.digitalocean.com/community/tutorials/how-to-index-and-slice-strings-in-python-3>
* Writing mathematical equations in Jupyter Notebooks: <https://medium.com/analytics-vidhya/writing-math-equations-in-jupyter-notebook-a-naive-introduction-a5ce87b9a214>
* Jupyter Notebook Markdown tutorial: <https://www.datacamp.com/community/tutorials/markdown-in-jupyter-notebook>