Machine Learning – COMP3032

Tutorial and Lab Practice 1 – Week 2

This lab practice is to ensure a basic familiarity with the Python and Spyder IDE. This lab will also review the related Mathematical concepts. Your class tutor will assist with explanations where necessary.

Tutorial

1. Get a book or on-line resource on Python programming, and read the sections regarding Python variables, data types and definitions, control structures, functions, as well as Python libraries NumPy and Pandas.
2. Maths revision: review vectors, matrices and their operations
3. Review the terminology introduced and concepts taught in Lecture 1.
4. What is supervised learning? What is unsupervised learning? What is reinforcement learning?

Lab Practice

1. Ensure that your CDMS computer account is active and that you can log in.
   1) Log in to Windows
   2) Start Spyder IDE by clicking:
      Start → Anaconda 3 → Spyder
   3) Spyder IDE has three (3) main panes
   4) The Editor Pane: for editting your scripts
   5) The Object Inspector Pane: for inspecting your files, variables, plots and help
   6) The Console Pane (IPython Shell) for running Python commands and showing the results of Python scripts

Python Basics

2. Download,open and run the programs polygon2.py. Use Plots button in the Object Inspector Pane to see the plot.
3. Write a program which asks users to enter five numbers, and then prints out the largest of the five numbers.

NumPy

4. Use NumPy to do the following:
   1) Create a 2x3 matrix A with random integers between 0 and 10, print it
   2) Create a 3x4 matrix B with random integers between 0 and 3, print it.
   3) Calculate A's transpose, print it
   4) Calculate the dot product of A and B, print it

Creating Pandas DataFrames

5. Generate the following table. Create a list, and then create a Panda DataFrames from the list and print it.

	make	model	year	fuel
0	Ford	Everest	2016	Diesel
1	Toyota	Kluger	2005	Petrol
2	Hyundai	Santa Fe	2010	Diesel
3	Honda	CR–V	2018	Petrol
4	Subaru	Forrester	2017	Petrol

6. Create a DataFrame from external source such as a csv file using the $read\_csv(' < path >')$ function. Run the following code:

```
import pandas as pd
cars = pd.read_csv('car_data.csv')
print(cars)
```