GISC405-22S1(C) (21 February to 03 June 2022)
GIS Programming and Databases
"Advanced Earth and Environmental Analytics"

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Assignment 1a
Due: Monday, 7th of March 2022, 10:00pm

Drop in Learn your Jupyter Notebook and rename it as follows by substituting the abc123 with your user code: abc123_Ass01a.ipynb Use commenting within your notebook to explain the objective of the scripts you write.

This assignment will help you develop on Lab 01 and Lab 02 learnings and give you the opportunity to revise the Jupyter notebooks for these labs and associated online learning resources. This is part one of a two part assignment (Assignment 1 = Assignment 1a + Assignment 1b). Assignment 1 will be assessed as per the marking scheme provided in the course hand out and will be marked 25%. Assignment 1a and 1b will be marked 12.5% each.

Task

Objective: Getting more familiar with xarray library, netcdf file structure and the gridded meteorological fields from the Weather Research and Forecasting (WRF) model.

1. Login to the Jupyter lab environment as explained in the labs using https://see-trx4001.canterbury.ac.nz:9552 and list the netcdf files present in /mnt/data/MetService_WRF. This is possible by executing the following line in your notebook:
   ls /mnt/data/MetService_WRF/
   The ls (Linux based command) has many options. My favourite is
   ls -lstrh /mnt/data/MetService_WRF/
   Try a few more from here: https://linuxcommand.org/lc3_man_pages/ls1.html
   a. ***What is the total size of the entire folder?***
   b. ***What is the total count of files present in that folder?***

2. In Jupyter notebook lab 02 we explored script to open netcfd files using the xarray library. Each file e.g. RH_20200101000000.nc contains hourly simulation (over 1 month period) records of the Relative Humidity meteorological variable gridded at one height level over New Zealand.
   a. ***Find another variable from the dataset that is recorded at various height levels. What is it?***
   b. ***Plot a time series of Relative Humidity for the month of January of any particular year from any location at the east coast of the South Island***
   c. ***Plot a time series of air temperature at 20m above ground level for the month of January for the same location you have chosen in (b)***
   d. ***Redo (b) and (c) over a 48 hour period of any two days of your choice***

For further information please contact the course coordinator/lecturer:
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