Script for Snowstorm test case SNOW2023
ATM419/563 Fall 2025

* ---------- preliminaries ---------- *
* make a directory in your lab space called SNOWSTORM, and move into it
* copy $LAB/SNOWSTORM/SETUP.TAR and
* unpack it: tar -xvf SETUP.TAR
* execute sh make_all_links.sh

* ---------- visualize domain and run geogrid ----------*
Launch Jupyterlab: https://jupyterhub.hpc.ucar.edu
Casper Login suffices. Execute plot_WRF_domain.ipynb notebook

qsub submit_geogrid
{Look for: “Successful completion of geogrid.”}

On Jupyterlab, execute plot_WRF_terrain.ipynb notebook to visualize terrain and provide information on MAPFAC_M values

* ---------- ungrib ----------*
./link_grib.csh $LAB/DATA/GFS_2023012212/gfs.* .
ls -al GRIBFILE* [make sure everything is OK]
wgrib2 GRIBFILE.AAA | more [looking at contents]

cp Vtable.GFS Vtable [select correct Vtable!]

UNGRIB CAN BE TIME-CONSUMING AND CAUSE RESOURCE CONTENTION
Listen for which option we will use for this demonstration

Option (A): Submit ungrib as a batch job
qsub submit_ungrib
tail -f ungrib.out Break out of tail with ctrl-C

Option (B): Link to prepared ungrib outputs [that space and dot are important]
ln -s $LAB/SNOWSTORM/UNGRIB/FILE* .

ungrib is done when you see: “Successful completion of ungrib.”
ungrib makes 10 gigabytes worth of outputs…
ls FILE*

```
* -------------- metgrid ----------------------------------------------------------------------*
qsub submit_metgrid
[look for Successful completion.... If issues, check metgrid.log.0000 file]
ls met_em*

ncdump -h met_em.d01.2023-01-22_12:00:00.nc | more [TAB COMPLETION!]

[Notice is says num_metgrid_levels = 34 in the header information]
[Note in namelist.input, we specify num_metgrid_levels = 34]

* -------------- TOUR of batch scripts -------------------------------------------------*
(see PPT)

* -------------- real.exe ---------------------------------------------------------------*
qsub submit_real

[NOTE JOB NUMBER ASSIGNED]
[check job status as directed]
myjobs

[when job is finished, check ‘tail’ of rsl.out.0000 file with ‘trsl’ command.
Make sure it says “SUCCESS COMPLETE REAL_EM INIT”]
trsl Break out of tail with ctrl-c

ls -al wrfbdy* wrfin*

* -------------- wrf.exe ------------------------------------------------------------------ *
qsub submit_wrf

[check job status as directed. WRF runs should take about 2 minutes.]
myjobs

* monitor WRF run
trsl (ctrl-c to break out)

[check for successful completion with ‘trsl’]

ls -1 wrfout_d01* (Verify you have wrfout_d01_2023-01-22_12:00:00)

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* ---------- analyze WRF simulation ---------- *

• Launch WRF_plot_SNOW2023_V3.ipynb

Cell #1 = openers
Cell #2 = useful functions
Cell #3 = define and open WRF output. Should not require editing.
Cell #4 = Extract some fields from WRF output
Cell #5 = Plot model topography
Cell #6 = Prepare for a plot of 10m winds, microphysics total precipitation, and cumulus total precipitation at final forecast time
Cell #7 = Plot 10m winds, microphysics total precipitation, and cumulus total precipitation at final forecast time
Cell #8 = Extract snow depth for a single location, convert to inches, and plot as a time series

* ---------- TOUR of namelist.input settings ---------- *
(see PPT, slides 41-end)

• examine model vertical grid (see slide 48)
dopython
python read_wrfinput.py wrfinput_d01