

Introduction to models practical

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0 Getting started

Log into windows (somehow).

Once you are finally in - load an xterminal window from the following menus:
Start → All Programs → Cygwin-X → xterm

The may take a while to load. A white window should open up.

Log into ARCHER. Replace `USERNAME` below with the one you were given on a separate piece of paper.

```
:~> ssh -X USERNAME@login.archer.ac.uk
```

Load the necessary python modules.

```
:~> module load numpy matplotlib
```

Move to your `/work` directory.

```
:~> cd /work/n02/n02/$USER
```

Copy the files you will need for the course.

```
:~> cp /work/n02/n02/pbrowne/dacourse.tar .
```

Unpack the files into your `/work` directory

```
:~> tar -xvf dacourse.tar
```

1 Lorenz 63 model

Move to the lorenz63 file.

```
:~> cd dacourse/l63
```

Open (and edit?) the data file storing details of the model.

```
:~> gedit lorenz63.dat
```

Save and exit the text editor.

Run the model and look at the output

```
:~> python lorenz63.py
```

2 Barotropic vorticity model

Now play with the barotropic vorticity model. This is a much bigger model and requires it to be sent to the queue on ARCHER to be processed.

Move to the appropriate directory:

```
:~> cd ../bv
```

Start python on ARCHER

```
:~> python
```

```
>>> from O_controlsBV import *
```

```
>>> O_setBV(met="Truth")
```

Exit python

```
>>> exit()    OR    Ctrl+d
```

This updates pf_parameters.dat which will control the fortran programs.

Now we must run *one* instance of the model to act as the truth.

Generate a submission script for ARCHER for this by running the command

```
:~> ensemble 1
```

This will generate a submission file `pbs_jobscript`. Submit this to the queue on ARCHER using the command

```
:~> qsub -q R546969.sdb pbs_jobscript
```

You can watch the status of the queue with the command

```
:~> qstat
```

more specifically, just your own jobs in the queue can be shown with the command

```
:~> qstat -u $USER
```

Note the letter in the penultimate column. Q means queuing, R means running, E means ending. When nothing appears as a result of running `qstat`, this means the job has left the queue. Hopefully it was successful.

When the job has finished, we can now look at the results. We shall do so in an interactive session on one of the main processing nodes on ARCHER.

```
:~> qsub -q R546969.sdb -IV1 select=1,walltime=0:30:0 -A n02-training -X
```

```
:~> cd /work/n02/n02/$USER/bv
```

```
:~> python
```

```
>>> from O_controlsBV import *
```

```
>>> O_plotsBV(met="Truth")
```

This will produce 5 figures, and save them as `Truth-{0..4}.png`. Try to understand the output.

When finished looking at the output, to exit press

```
>>> Ctrl+d
```

Now exit the interactive job.

```
:~> Ctrl+d
```