

## AMath 574 January 28, 2011

### Today:

- Plotting in Python

### Monday:

- Boundary conditions
- Multi-dimensional

### Reading: Chapters 7, 18, 19

Plotting documentation:

<http://www.clawpack.org/users/plotting.html>

## Notes:

## Python plotting tools

Directory `_output` contains files `fort.t000N`, `fort.q000N` of data at [frame N](#) (N'th output time).

`fort.t000N`: Information about this time,

`fort.q000N`: Solution on all grids at this time

There may be many grids at each output time.

Python tools provide a way to specify what plots to produce for each frame:

- One or more [figures](#),
- Each figure has one or more [axes](#),
- Each axes has one or more [items](#),  
(Curve, contour, pcolor, etc.)

## Notes:

## setplot function for specifying plots

The file `setplot.py` contains a function [setplot](#)  
Takes an object `plotdata` of class [ClawPlotData](#),  
Sets various attributes, and returns the object.

Documentation: [www.clawpack.org/users/setplot.html](http://www.clawpack.org/users/setplot.html)

**Example:** 1 figure with 1 axes showing 1 item:

```
def setplot(plotdata):
    plotfigure = plotdata.new_plotfigure(name,num)
    plotaxes = plotfigure.new_plotaxes(title)
    plotitem = plotaxes.new_plotitem(plot_type)
    # set attributes of these objects
    return plotdata
```

## Notes:

## setplot function for specifying plots

**Example:** plot first component of  $q$  as blue curve, red circles.

```
plotfigure = plotdata.new_plotfigure('Q', 1)
plotaxes = plotfigure.new_plotaxes('axes1')

plotitem = plotaxes.new_plotitem('1d_plot')
plotitem.plotvar = 0 # Python indexing!
plotitem.plotstyle = '-'
plotitem.color = 'b' # or [0,0,1] or '#0000ff'

plotitem = plotaxes.new_plotitem('1d_plot')
# plotitem now points to a new object!
plotitem.plotvar = 0
plotitem.plotstyle = 'ro'
```

## Notes:

## Plotting examples and documentation

**General plotting information:** (e.g., “make .plots” vs. interactive)

[www.clawpack.org/users/plotting.html](http://www.clawpack.org/users/plotting.html)

**Use of setplot, possible attributes:**

[www.clawpack.org/users/setplot.html](http://www.clawpack.org/users/setplot.html)

**Examples:**

**1d:** [www.clawpack.org/users/plotexamples.html](http://www.clawpack.org/users/plotexamples.html)

**2d:** [www.clawpack.org/users/plotexamples2d.html](http://www.clawpack.org/users/plotexamples2d.html)

**FAQ:** [www.clawpack.org/users/plotting\\_faq.html](http://www.clawpack.org/users/plotting_faq.html)

**Gallery of applications:**

[www.clawpack.org/users/apps.html](http://www.clawpack.org/users/apps.html)

## Notes: