Tutorial: Recursion & Image Analysis

`git pull` and copy the Tutorial 24 materials into your own directory.

`journal` this work.

To start, run the demo from class:
`.r binary_tree.pro`
`.r bintree_example.pro`

Then, do a binary sort for 5 arrays, of length 10, 100, 1000, and 10000. Record each number into an array `n_binary` for plotting.

Do the same with insertion sort, using the variable `n_insert`.

Plot these:

```
x = [10,100,1000,10000]
plot,x,n_insert
oplot,x,n_binary
```

Then do it again with `/ylog,/xlog`.

You should see that insertion sort and binary sort are nearly the same number of steps for small arrays, but that insertion sort should take much longer for large arrays.

Image Analysis

In order to do this section, you must complete the FITSFILES tutorial. Do that now if you haven't. Do it in a different terminal window so you don't have to close your IDL window.

Still in the tutorial directory, open `pixel_identification.pro` and `recursive_pixel_identification.pro` in an editor.

In `pixel_identification.pro`, change the `!PATH` variable at the top to point to your personal `astron/pro/` directory.

Compile `recursive_pixel_identification.pro`, then run `pixel_identification.pro`. The latter is littered with `stop` statements, so you'll need to use `.c` to go to the next step each time.

Once you've completed that, use the `mask3` variable to cut out an image of a single star and display it.

Bonus for the day: Centroid that star (find its x and y center position), then overplot the centroid with a + symbol in an appropriate color.