Reading and manipulating data

with  astropy

file types

Data comes in many file types

Some are specific to astronomy, some are general

Either **ASCII** (text) or **binary**

file types

ASCII:

+ Easy to read / edit (open in a text editor)
+ Don’t require specialized file reader/writer
- Easy to corrupt
- Slower to read: have to be parsed line-by-line each time they are loaded

e.g., CSV, text with custom delimiter

file types

Binary files:

+ Faster to read - can pre-define strict types
+ Can compress better
- Require specialized file reader/writer
- Can’t be opened for quick viewing / edits

e.g., FITS, HDF5

tabular data

In astronomy, much of the data we pass around is tabular, e.g., catalogs, spectra, …

Astropy provides a class for representing and working with tables of data: the `Table` object

Can read from CSV or other delimited text files, FITS tables, HDF5 tables, VO tables, etc. and get back a `Table`

`Table`

The `Table` object supports common manipulation functionality, like adding or removing rows, columns

Tables can be combined through stacking or database-style “join” operations

A special table class, the `QTable`, allows using Quantity objects as columns - support reading and writing tables with unit information!