

# ScienceTask exercises

November 22, 2005

## Locate RawScienceFrames

*Question 1:* You have been given a list of dates and object names or filenames. Locate the `RawScienceFrames` at the `awe` prompt.

Instruction: Use information in the [Python database querying HOW-TO](http://portal.astro-wise.org/) at the ASTRO-WISE portal (<http://portal.astro-wise.org/>) to construct a query that contains your and only your `RawScienceFrames`.

Answer:

```
awe> date = DateTime.DateTimeFrom('2001-01-01')
awe> q = (RawScienceFrame.DATE_OBS == date)
awe> q &= (RawScienceFrame.instrument.name == 'WFI')
awe> q &= (RawScienceFrame.filter.name == '#877')
awe> q &= (RawScienceFrame.OBJECT.like('Science*'))
awe> len(q)
<some number of frames>
awe> for f in q: print f.filename, f.DATE_OBS, f.filter.name, f.OBJECT
.
.
.
```

A more direct way would be to use the `select` method:

Answer:

```
awe> q = RawScienceFrame.select(date='2001-01-01', instrument='WFI', filter='#877',
                                object='Science*')
awe> len(q)
<some number of frames>
awe> for f in q: print f.filename, f.DATE_OBS, f.filter.name, f.OBJECT
.
.
.
```

## Process RawScienceFrames

*Question 2:* Process the `RawScienceFrames` that you found in the previous question.

Instruction: Follow the instructions in the [ScienceTask HOW-TO](http://portal.astro-wise.org/) at the ASTRO-WISE portal (<http://portal.astro-wise.org/>) to process your `RawScienceFrames` into `ReducedScienceFrames`.

Answer:

```
awe> dpu.run('Science', d='2001-01-01', i='#877', f='#877', o='Science*')
```

*Question 3:* Retrieve and inspect the logs from the DPU.

Instruction: Follow the instructions in the [ScienceTask HOW-TO](#) at the ASTRO-WISE portal (<http://portal.astro-wise.org/>) to retrieve the logs.

Answer:

```
awe> dpu.get_logs()  
.  
.  
.
```

## Inspect ReducedScienceFrame

*Question 4:* How well did the calibration correct for instrumental effects?

Instruction: Use the instructions in the [ScienceTask HOW-TO](#) at the ASTRO-WISE portal (<http://portal.astro-wise.org/>) to view one of your `ReducedScienceFrames` (one CCD only).

Answer:

```
awe> rq = ReducedScienceFrame.raw == q[0]  
awe> os.system('skycat %s' % (rq[0].filename))
```

## Determine which calibration frames were used

*Question 5:* After visual inspection, the `ReducedScienceFrames` may not look optimal. Determine what calibration frames were used.

Instruction: Use the instructions in the [ScienceTask HOW-TO](#) at the ASTRO-WISE portal (<http://portal.astro-wise.org/>) to ask the `ReducedScienceFrame` which calibration files were used in its creation.

Answer:

```
awe> red = rq[0]  
awe> red.filename  
<some output filename>  
awe> red.raw.filename  
'WFI.2000-12-20T01:21:43.805_7.fits'  
awe> red.bias.filename  
'2000-04-26cal541_ccd56.fits'  
awe> red.flat.filename  
'2000-04-21cal546-#845_ccd56.fits'
```