

# Data Processing School :: Exercise 50

|                         |                                    |
|-------------------------|------------------------------------|
| <b>Source directory</b> | /data/lofarschool/data/exercise 50 |
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## Context

This exercise demonstrates a simple tool for summarizing the data in a Measurement Set. The tool uses PyDAL, a library that allows one to use Python to interact with various kinds of data, especially Measurement Sets.

## Prerequisite

A little knowledge of shell and python programming (or at least a curiosity to learn).

## Description

This exercise is to familiarize you with how to run shell and python scripts that use the PyDAL. First, the user should run the script and study the output to understand the structure of the data. Second, the user should try to customize the bash and python scripts.

## Files & Directories

The user will find three files in the data directory:

1. L2007\_01810\_SB18-20\_0B20.MS - dataset to study
2. msinfo.py - python script that summarizes the MS info
3. run\_script.sh - bash script that runs msinfo.py

## Step-by-step instructions

1) Run “run\_script.sh” and examine the output text. The information there can help you answer the following questions:

a) What year was this observation taken? b) Is this raw or processed data? c) How many subbands went into this MS?

2) Try running “msinfo.py” on a different measurement set (e.g., the data from the MeqTrees exercise). To do this you can modify “run\_script.sh” or run the python script directly (the latter requires you to set the PYTHONPATH variable, however). How is the other Measurement Set different from the one given with this exercise?

3) Modify “msinfo.py” to print the DATA, CORRECTED\_DATA, and MODEL\_DATA for the \*last\* 10 integrations.

## Example outputs

```
lio0ff025> ./run_script.sh
PYTHONPATH =
/app/usg/release/lib/python:/home/claw/bin:/app/usg_dal/lib/python:/home/claw/tkp-code-repository/pipe/python-packages:/app/pipeline/python64:/app/pipeline/python64/mirlib:/app/lofar/renting:/app/lofar/stable:/app/pyrap/lib
Running: python ./msinfo.py L2007_01810_SB18-20_0B20.MS 1
```

Summary of UV data for L2007\_01810\_SB18-20\_0B20.MS

Phase center (deg): (-9.15026986482,58.8167346557)  
Frequency range (MHz): (64.9987792969, 64.9987792969)  
Wavelength range (m): (4.61227828035, 4.61227828035)  
Time range (MJD): (4681981850.0, 4682040303.92) s or 16.23719936 hrs  
Integrations, Time bin size: 978, 59.768832 s  
Channels, Width: 1, 143.432617188 kHz  
Polarizations: 4

Number of antennas: 16

```
['CS010_dipole0' 'CS010_dipole4' 'CS010_dipole8' 'CS010_dipole12'
'CS001_dipole0' 'CS001_dipole4' 'CS001_dipole8' 'CS001_dipole12'
'CS008_dipole0' 'CS008_dipole4' 'CS008_dipole8' 'CS008_dipole12'
'CS016_dipole0' 'CS016_dipole4' 'CS016_dipole8' 'CS016_dipole12']
```

Data columns (first 10 ints, middle channel, xx poln):

```
DATA          [ 0.+0.j  0.+0.j  0.+0.j  0.+0.j  0.+0.j  0.+0.j  0.+0.j
0.+0.j  0.+0.j
0.+0.j]
```

```
CORRECTED_DATA [ 0.+0.j  0.+0.j  0.+0.j  0.+0.j  0.+0.j  0.+0.j  0.+0.j
0.+0.j  0.+0.j
0.+0.j]
```

```
MODEL_DATA     [ 0.+0.j  0.+0.j  0.+0.j  0.+0.j  0.+0.j  0.+0.j  0.+0.j
0.+0.j  0.+0.j
0.+0.j]
```

## Outstanding problems

Text has now been corrected - ER

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