epauxcomb

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Abstract

Combines the two tables of a PN ODF Auxiliary file

1 Instruments/Modes

Instrument	Mode
PN	all

2 Use

pipeline processing	no
interactive analysis	yes

3 Description

This task creates a copy of an input PN ODF Auxiliary File, with the first table containing additional columns corresponding to the Second Binary Table of the Auxiliary File. This allows tools such as **tabgtigen**, which can only handle single tables, to process *all* the data specified in such files.

The combination is performed as follows:

A copy of the original dataset is made to the dataset specified by the parameter `outset`. The first table in the new dataset will form the new combined table, and implicitly contains a copy of the First Binary Table.

Combining the data in the Second Binary Table is relatively complex. The combination is based on the two common columns across the tables, the `CYCLE` column and the `QUADRANT` column. Each row in the Second Binary Table of the Auxilary File is uniquely identified by the `CYCLE` and `QUADRANT` pair. This pair occurs in one or more rows in the First Binary Table (as there is one or more active CCDs listed with in the combined table with that `CYCLE/QUADRANT` combination).

epauxcomb firstly creates 5 new columns in the combined table corresponding to the remaining columns of the Second Binary Table (ie the `NABOVE`, `NDEFA`, `NEPDH` ,`NDISCLIN` and `MCOMMODE` columns). It then loops through each row of the Second Binary Table, noting the values in the columns `NABOVE`, `NDEFA`,

NEPDH, NDISCLIN and MCOMMODE. For *each* row in the combined table that the same CYCLE/QUADRANT pair appears, **epauxcomb** writes out the noted values to the corresponding columns in the combined table.

These noted values may be copied to more than one row in the combined table. There may also be one or more rows remaining in the combined table that contain CYCLE/QUADRANT pairs which are not listed in the Second Binary Table; for these rows, the entries for NABOVE, NDEFA, NEPDH, NDISCLIN and MCOMMODE are set to zero.

3.1 Examples

To combine the tables in the ODF file 0001_0000010010_PNS00100AUX.FIT, the following command can be used:

```
epauxcomb set=0001_0000010010_PNS00100AUX.FIT outset=outset.ds
```

4 Parameters

This section documents the parameters recognized by this task (if any).

Parameter	Mand	Type	Default	Constraints
set	yes	data-set	set.ds	none

Name of input PN ODF AUX file

outset	no	data-set	outset.ds	none

Name of output dataset that includes a copy of all the information in the original dataset, plus the combined table.

5 Errors

This section documents warnings and errors generated by this task (if any). Note that warnings and errors can also be generated in the SAS infrastructure libraries, in which case they would not be documented here. Refer to the index of all errors and warnings available in the HTML version of the SAS documentation.

There are no errors raised by the task itself. I/O errors will be raised by the DAL.

6 Input Files

A PN ODF Auxiliary File, specified through the parameter set.

The format of the file is detailed in [1], but is summarised here:

1. A table labelled PNAUX1 containing the following columns:
   - FRAME of type int-32
   - CYCLE of type int-32
   - FTCOARSE of type int-16
   - FTFINE of type unsigned int-16
   - QUADRANT of type int-8
   - CCDID of type int-8
2. A table labelled PNAUX2 containing the following columns:
   - CYCLE of type int-32
   - QUADRANT of type int-8
   - NABOVE of type unsigned int-16
   - NDEFA of type int-16
   - NEPDH of type unsigned int-16
   - NDISCLIN of type int-16
   - MCOMMODE of type unsigned int-16

7 Output Files

A copy of the original dataset, with the first table containing four additional columns: NABOVE, NDEFA, NEPDH, NDISCLIN and MCOMMODE. The name of this dataset is specified through the parameter set.

The overall format of the new dataset is as follows

1. A table labelled PNAUX1 containing the following columns:
2. A table labelled PNAUX1 containing the following columns:
   - FRAME of type int-32
   - CYCLE of type int-32
   - FTCOARSE of type int-16
   - FTFINE of type unsigned int-16
   - QUADRANT of type int-8
   - CCDID of type int-8
   - NABOVE of type unsigned int-16
   - NDEFA of type int-16
   - NEPDH of type unsigned int-16
   - NDISCLIN of type int-16
   - MCOMMODE of type unsigned int-16
3. A table labelled PNAUX2 containing the following columns:
   - CYCLE of type int-32
   - QUADRANT of type int-8
   - NABOVE of type unsigned int-16
   - NDEFA of type int-16
   - NEPDH of type unsigned int-16
   - NDISCLIN of type int-16
   - MCOMMODE of type unsigned int-16

8 Algorithm

- Copy dataset specified by parameter set to that specified by parameter outset.
- Access table PNAUX1 in new dataset; this is the new combined table.
- Access table PNAUX2 in new dataset. This is (a copy of) the Second Binary Table, and will be combined with the table listed above.
- Create 5 new columns (NABOVE, NDEFA, NEPDH, NDISCLIN and MCOMMODE) in the combined table.
- Set the initial value of each entry in the above columns to zero.
- For each row in Second Binary Table
  - Note the column values of that row (ie CYCLE, QUADRANT, NABOVE, NDEFA, NEPDH, NDISCLIN and MCOMMODE)
  - For each row in combined table
    - if the value of the CYCLE column for matches that of the CYCLE value noted, AND the value of the QUADRANT column for matches that of the QUADRANT value noted, then copy the NABOVE, NDEFA, NEPDH, NDISCLIN and MCOMMODE values noted to the corresponding columns in the combined table.
- End loop
- Close dataset and cleanup

9 Comments

None.

References

[1] ESA. XMM Interface Control Document: Observation and Slew Data Files (XSCS to SSC) (SciSIM to SOCSIM). Technical Report XMM-SOC-ICD-0004-SSD Issue 2.5, ESA/SSD, June 2000. Found at the URL: ftp://astro.estec.esa.nl/pub/XMM/documents/odf_icd.ps.gz.