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EXFOR Utility Codes

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96/11

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Abstract

Descriptions are given for a package of utility codes operating on the experimental nuclear reaction data files in the EXFOR format. This program package is written in Python and may be downloaded from the NRDC website (<http://nds.iaea.org/nrdc/>).

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Introduction

The EXFOR Utility Codes are written to process EXFOR formatted files. Currently, the following four codes are included in this package.

- DIRINI: Split an EXFOR library tape into EXFOR entry files.
- DIRUPD: Update the EXFOR entry files with an EXFOR transmission tape.
- MAKLIB: Merge EXFOR entry files into a single library tape.
- SEQADD: Add record identification and bookkeeping information to an EXFOR file.

This document explains how to use these codes. Users need to install Python3 in their environments prior to run these utility codes. Any comments on the use of the codes, including difficulties encountered or any suggestions are welcome.

DIRINI

This code reads an EXFOR library tape (e.g., a master) in EXFOR formats with `MASTER`, `LIB` or `REQUEST` record as the first record, splits it into entries, and saves each entry file in an entry storage. It initialises the storage (i.e, namely delete the files in the storage directory) at the beginning of processing.

Input

- library tape (can be an argument following `-l`)

Output

- entry files (e.g., `./entry/a/a0510.txt`)
- log file (`dirupd.log`)

Option

- `-h` Display help information
- `-v` Display the version
- `-f` Never prompt
- `-c` Delete (1) trailing blanks in col. 12-66, (2) line sequential number (col.67-80) and (3) N2 of ENDBIB/ENDCOMMON/ENDSUBENT/ENDENTRY.
- `-l library_tape` Specify the library tape to read
- `-d storage_directory` Specify the entry storage directory for outputs

Example

Initialise the entry storage directory *entry* by loading the input library tape *lib/library.txt* (without elimination of the record identification and bookkeeping if the input library has them):

```
python3 x4_dirini.py -l lib/library.txt -d entry
```

At the end of processing, one obtains entry files under *entry/1/*, *entry/2/*, etc. and a log file with a new line like

Seq.	Update date/time	Trans (N1)	Trans (N2)	Centre	Tape
0	2023-10-04 00:48:30.849567	0001	20231004		lib/library.txt

DIRUPD

This code reads a trans tape (starting from the `TRANS` record), and adds or updates the entry files in the local storage.

Input

- trans tape (can be an argument following `-t`)
- entry storage (can be an argument following `-d`)

Output

- entry files (e.g., `./entry/a/a0510.txt`)
- log file (`dirupd.log`)

Option

- `-h` (Same as `DIRINI`)
- `-v` (Same as `DIRINI`)
- `-f` (Same as `DIRINI`)
- `-c` (Same as `DIRINI`. Use this option if you use it for `DIRINI`.)
- `-t trans_tape` Specify the trans tape to read
- `-d storage_name` (Same as `DIRINI`)

Example

Update of the entry storage *entry* by a tape *trans/trans.1234*:

```
python3 x4_dirupd.py -t trans/trans.1234 -d entry
```

At the end of processing, one obtains new and/or updated entry files under *entry/1/* etc. and a log file with a new line like

Seq.	Update date/time	Trans (N1)	Trans (N2)	Centre	Tape
0	2023-10-04 00:48:30.849567	0001	20231004		lib/library.txt
1	2023-10-04 00:48:31.725707	1234	20160121	NNDC	trans.1234

MAKLIB

This reads and combines the entry files in the entry storage and create a single library tape.

Input

- entry storage (can be an argument following -d)

Output

- library tape with LIB and ENDLIB records as the first and last records.

Option

- -h (Same as DIRINI)
- -v (Same as DIRINI)
- -f (Same as DIRINI)
- -a addition of “19” to two-digit year in N2 of ENTRY/SUBENT/NOSUBENT.
- -n exclusion of dictionaries
- -d *storage_name* (Same as DIRINI)
- -l *library_tape* Specify the library tape to create
- -i *tape_ID* An integer printed at cols 12-22 of the first record

Example

Create a library tape *lib/library.txt* by merging entry files in the storage *entry* with the tape ID 001:

```
python3 x4_maklib.py -d entry -l lib/library.txt -i 0001
```

This operation does not add a new line in the log file.

Note: The format of the output library tape depends on the format of the files in the entry storage. If user maintains the entry files in the storage without record identifications etc. (e.g., with -c option of DIRINI and DIRUPD), then the produced library tape also does not have them. The record identifications can be added by processing the output library tape by SEQADD.

SEQADD

This code adds and/or updates record identifications (cols.67-79) and bookkeeping information such as N1 and N2 of BIB and ENDBIB. records. (Similar to ORDER developed at NNDC and ZORDER developed at NDS).

Input

- entry, trans or library tape (can be an argument following -i)

Output

- entry, trans or library tape with updated record identifications and bookkeeping

Option:

- -h (Same as DIRINI)
- -v (Same as DIRINI)
- -f (Same as DIRINI)
- -m do not add “19” to two-digit year in N2 of ENTRY/SUBENT/NOSUBENT, and do not alter N2 of ENDBIB/ENDCOMMON/ENDDATA/ENDSUBENT/ENDENTRY/ENDSUBDICT records.
- -i *input_file* Specify the input
- -o *output_file* Specify the output

Example

Create a new trans tape *trans/trans.ord* by adding and updating the record identification and bookkeeping information in *trans/trans.txt*.

```
python3 x4_seqadd.py -i trans/trans.txt -o trans/trans.ord
```

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