Data structures sd_listr8 and sd_listis

Summarized:
Data structures here are described:

- sd_listr8 : list realities created by DEFI_LIST_REEL [U4.21.04].
- sd_listis : list integers created by DEFI_LIST_ENTI [U4.21.05].

Contents

1 data structures sd_listr8 and sd_listis in short

the data structure sd_listr8 contain a list of realities.

The data structure sd_listis contains a list of integers.

2 Tree structure

```
sd_listr8  (k19)  :: =  record
   ♦  ".BINT":  S V R8
   ♦  ".LPAS":  S V R8
   ♦  ".NBPA":  S V I
   ♦  ".VALE":  S V R8

sd_listis  (k19)  :: =  record
   ♦  ".BINT":  S V I
   ♦  ".LPAS":  S V I
   ♦  ".NBPA":  S V I
   ♦  ".VALE":  S V I
```

3 Contained objects

We detail the contents of the objects of the data structure sd_listr8, those of the data structure sd_listis are identical in all points to the only difference of objects ".BINT", ".LPAS" and ".VALE" which contain integers instead of realities. The structure can seem complicated to store a list of realities. Object ".VALE" would be enough. It contains indeed the list. The structure is designed to benefit owing to the fact that the numbers of the list can be regularly spaced: list "with constant step" per pieces. In this case, certain algorithms use this notion of constant step. The description of the list in fact is doubled:

- ".VALE" : the list of the values, "
- .BINT contains", ".LPAS" and ".NBPA" : information equivalent to this list contains.

Let us suppose that one wants to store the list of 8 realities:

1	$a0=a0$
2	$a1=a0+1*dt1$
3	$a2=a0+2*dt1$
4	$a3=a2+1*dt2$
5	$a4=a2+2*dt2$
6	$a5=a2+3*dt2$
7	$a6=a5+1*dt3$
8	$a7=a5+2*dt3$

the contents of objects ".VALE" and ".BINT" will be:

```
".VALE": S V R8 dim = 8

       v (1) = a0
       v (2) = a1
       …
       v (8) = a7
```

This object contains the values of the list.

```
".BINT": S V R8 dim = 4

       v (1) = a0
       v (2) = a2
       v (3) = a5
       v (4) = a7
```

This object contains the ends of the zones where the step is constant.

Objects." LPAS "and " . NBPA " will contain:

".LPAS": S V R8 dim = 3 (This object contains the values of the "steps")

$v(1)=d1$	value of the 1st step
$v(2)=d2$	value of the 2nd step
$v(3)=d3$	value of 3rd step

".NBPA": S V I dim = 3 (This object contains the number of "steps" for each interval)

$v(1)=2$	many intervals length $d1$
$v(2)=3$	many intervals length $d2$
$v(3)=2$	many intervals length $d3$

In the case (general) where the list has several elements:

length (LPAS) = long (NBPA)
long (BINT) = long (NBPA) + 1

Remark

For the lists of realities, it can arrive that the value of the "constant step" (object " .LPAS") is not an exact divider length of the "zones" (object " .BINT"). The consequence is that the last "step" of a zone can be slightly different from the others not zone. This difference cannot be higher than 10^{-3} (in relative value).

Typical case of the list having 1 only element:

If the list has only one element:

length (VALE) = long (BINT) = long (LPAS) = long (NBPA) = 1 VALE (1) = BINT (1)

4 Command file

4.1 Examples

```
LISTR8 = DEFI_LIST_REEL  (debut      = 1. ,
                 INTERVALLE  = (  _F (JUSQU_A=5., PAS=2.),
                                  _F (JUSQU_A=7., NOMBRE=2))))

LISTIS = DEFI_LIST_ENTI  (VALE  = (1,3,5,6,7))

IMPR_CO (CONCEPT=_F (NOM= (LISTR8, LISTIS)) )
```

4.2 Contained Data structure

```
objects: LISTR8:
================================================================================
PRINTING OF THE CONTENU OF THE OBJECTS FIND:
--------------------------------------------------------------------------------
PRINTING SEGMENT OF VALUES >LISTR8             .BINT<
               1 -  1.00000E+00  5.00000E+00  7.00000E+00
--------------------------------------------------------------------------------
PRINTING SEGMENT OF VALUES >LISTR8             .LPAS<
               1 -  2.00000E+00  1.00000E+00
--------------------------------------------------------------------------------
PRINTING SEGMENT OF VALUES >LISTR8             .NBPA<
               1 -  2      2
--------------------------------------------------------------------------------
PRINTING SEGMENT OF VALUES >LISTR8             .VALE<
               1 -  1.00000E+00  3.00000E+00  5.00000E+00  6.00000E+00
7.00000E+00

====> IMPR_CO OF Data structure: LISTIS  :
================================================================================
PRINTING OF THE CONTENU OF THE OBJECTS FIND:
--------------------------------------------------------------------------------
PRINTING SEGMENT OF VALUES >LISTIS              .BINT<
               1 -   1     3     5     6     7
--------------------------------------------------------------------------------
PRINTING SEGMENT OF VALUES >LISTIS              .LPAS<
               1 -   2     2     1     1
--------------------------------------------------------------------------------
PRINTING SEGMENT OF VALUES >LISTIS              .NBPA<
               1 -   1     1     1     1
--------------------------------------------------------------------------------
PRINTING SEGMENT OF VALUES >LISTIS              .VALE<
               1 -   1     3     5     6     7
```