

The folder "PrimitiveSD\_almost\_simple" contains 45 files named "SymDes $v$ ",  $v = 11, 15, 21, 35, 36, 40, 45, 56, 57, 63, 85, 91, 121, 133, 144, 156, 176, 183, 255, 273, 341, 351, 364, 378, 381, 400, 511, 553, 585, 651, 781, 820, 871, 993, 1023, 1057, 1365, 1407, 1464, 1893, 2047, 2257, 2380, 2451$  and 14080. For each  $v$ , SymDes $v$  contains the list "D $v$ " which is a record of all constructed primitive symmetric designs with  $v$  points. Here the number of entries in "D $v$ " is at most 2. The point set of all designs is  $\{1, 2, 3, \dots, v\}$ .

The record of a particular design is an element of the list "D $v$ ", say  $i$ -th element D $v$ [ $i$ ]. For instance, list "D364" from the file "SymDes364" has two elements: D364[1] and D364[2]. The first is a record of projective geometry  $PG(5, 3)$ , and the latter is a record of rank 3 symmetric design (364, 121, 40).

The abbreviation "**rec**" stands at the beginning of each list element. It separates different designs if the list has more than one element.

The record of a design D $v$ [ $i$ ] has the following two important components:

1. *Aut*D $v$ [ $i$ ] generators' permutation representation;
2. set  $B$  of all blocks of D $v$ [ $i$ ].

Besides, the record gives some other information on the design. Because of the transitivity, any block  $B \in B$  is a base block of D $v$ [ $i$ ] and the other blocks can be obtained by the action of *Aut*D $v$ [ $i$ ] on  $B$ . *Aut*D $v$ [ $i$ ] is a primitive group of almost simple type for every admissible pair  $(v, i)$ . Due to some technical reasons, *Aut*D $v$ [ $i$ ] is not provided by GAP for several projective geometries.

An example of a simple analysis of a design performed in GAP by using our record files can be found in "info" file of the folder "PrimitiveSD\_prime\_power".

Should our files be used for more detailed analysis, "GRAPE" and "DESIGN" packages have to be installed under GAP. These packages are loaded within GAP by calling the statement:

```
gap> LoadPackage("grape");
true
gap> LoadPackage("design");
true
```

For more information the reader is pointed to:

- L.H. Soicher, The DESIGN package for GAP, Version 1.3, 2006,  
[http://designtheory.org/software/gap\\_design/](http://designtheory.org/software/gap_design/)
- L.H. Soicher, The GRAPE package for GAP, Version 4.3, 2006,  
<http://www.maths.qmul.ac.uk/~leonard/grape/>

The readers not acquainted with GAP can use SymDes $v$  files as text files with information on designs' full automorphism groups permutation representation and basic blocks.