

AN ALGOL-60 PROGRAM FOR POLLEN ANALYTICAL DATA; THE CDC VERSION

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SUMMARY

This paper describes the CDC version of a formerly published computer program for the computation and graphical representation of pollen analytical data.

1. INTRODUCTION

In preparing a CDC version of the ALGOL-60 computer program for the computation and graphical representation of pollen analytical data (VOORRIPS 1973), two main problems were encountered. The first problem was the bringing into accordance of the input/output statements with the CDC implementation of the ACM proposal for input/output conventions in ALGOL-60, version 3 (CDC 1972a). This meant a total rewriting of the input/output. Expressions that may cause errors under version 4 of the CDC ALGOL-60 compiler (CDC 1973) have been avoided.

The second problem was the different way of file handling under SCOPE 3.4, the CDC operating system in use at SARA, the Amsterdam academic computing centre (CDC 1972b). The CDC version of the program uses three input-files and one output-file. At least one of the input-files has to be the system-file INPUT. It has to contain the information about the other input/output-files.

A second input-file, which may or may not be the system-file INPUT, has to contain the so called "setup". This setup contains the information as described in chapter 5, nrs. 1–68, of the original paper (VOORRIPS 1973). The last input-file, that again may or may not be the system-file INPUT, has to contain the data-matrix as described in nr. 69 of chapter 5 of the original paper. The output-file will contain all the output of the program and may or may not be the system-file OUTPUT. As will be shown in the examples, this method of file handling offers possibilities for both a very simple handling of the input and the output as well as a more sophisticated one. The latter makes it easy to modify the setup without "touching" the data-matrix, to check the output on a visual display unit before having it printed and to run different data-sets or the same data-matrix with different setups at the same time.

2. INPUT MODIFICATIONS

Most of the input modifications are small ones, made necessary by the use of punched cards or card-image records as an input medium instead of paper

tape. The format-free character of the input has been maintained. If not stated otherwise, the numbers have to be separated by number delimiters, i.e. comma's, slashes or (at least two) blanks. There is one major modification:

Calculation of the influx values is only possible when the concentration values have been calculated in the same run. This seems more practical than the original possibility to give the concentration values as input.

In describing the input modifications, the key in chapter 5 of the original paper is followed. Punched cards are assumed to be the input medium.

The nrs. 1, 2 and 3 have to be replaced by:

1. Punch the numbers of the input channel containing the setup, of the input channel containing the data-matrix and of the output channel.
– See also chapter 4, jobcontrol and examples. –
2. Punch the name of the data-set to be computed and printed, beginning at position 1 of a new card (title). Maximum length of this name is 72 characters.
3. Beginning on a new card, punch the number of pollentypes (n types).

nr. 57 has to be replaced by:

57. corconc (9) = 0 and corinf (10) = 0? Then proceed to 63.

nr. 65 has to be replaced by:

65. Punch the names of the groups, each beginning at position 1 of a new card (gname). Maximum length of these names is 40 characters.

	Column 1	Column 2	Column 3	Columns 4-10	
				type or group indices type or group names	
2a	spectrum index	total number of counted grains (TOTAL)		raw values of types or groups	
2b	spectrum index	total number of counted grains (TOTAL)	pollensum (SUM)	raw values of types or groups	relative values of types or groups
2c	spectrum index	total number per unit of volume or weight (CONC. SUM)	number of counted exotics (EXOTICS)	concentration values of types or groups	
2d	spectrum index	total number per unit of volume per unit of time (INFL. SUM)	AR / Ts x 100 (100 x CA)	influx values of types or groups	

nr. 67 and 68 have to be replaced by:

67. Punch the names of the types, each beginning at position 1 of a new card (name). Maximum length of these names is 40 characters.

68. Punch ++ in the positions 1 and 2 of a new card.

nr. 70 has to be replaced by:

70. If you have another data-set then start again at 1.

3. OUTPUT MODIFICATIONS

Both in the tables as well as in the graphs some of the characters used originally have been replaced in order to agree with the ASCII-64 character code. A new scheme of the various possibilities in printing the tables is presented in *fig. 1*. The maximum number of the printed characters of the names of pollen types or -groups at the heads of the columns is reduced to 10, due to the somewhat more compressed format of the tables.

4. JOBCONTROL AND EXAMPLES

The normal control commands of the SCOPE 3.4 operating system will not be discussed here.

The first example is a simple case in which the input consists of punched cards and the results are sent to the line printer.

JOBNAME, T200, CM55000.

ALGOL, Q.

compiling under the Q option results in a quicker execution

LGO.

eor

this represents the 7/8/9 multipunch in column 1 of a card

program deck

eor

60, 60, 61

these are the channel numbers of the system-files INPUT (60) and OUTPUT (61)

setup

data-matrix

eor

eor

this represents the 6/7/8/9 multipunch in column 1 of a card

The second example presents a case in which a data-matrix will be run with two different setups. The compiled program is on a permanent file, named PROG. The first setup is on a permanent file, named SETONE, the second setup is on punched cards. The data-matrix is on a permanent file, named DATA. The results of the run with the first setup are sent to the line printer, the results of

the run with the second setup are written on a permanent file named TESTOUT. The (necessary) correspondence between the channel numbers of the files in the second record and the numbers in the beginning of the third record should be noted.

```
JOBNAME, T400, CM70000.
ATTACH, PROG, ID = TEST.
ATTACH, SETONE, ID = TEST.
ATTACH, DATA, ID = TEST.
REQUEST, TESTOUT, *PF.
PROG.
CATALOG, TESTOUT, ID = TEST.
```

eor

```
CHANNEL, 10 = SETONE, P80, R
```

The setup and the data must have "card-image" format

```
CHANNEL, 20 = DATA, P80, R
```

```
CHANNEL, 30 = TESTOUT,
```

The output has a width of 130 characters

```
P130, PP60, R
```

```
CHANNEL, END
```

eor

```
10, 20, 61
```

```
60, 20, 30
```

```
second setup
```

```
eoi
```

5. REQUIREMENTS AND AVAILABILITY

About 50000 (octal) central memory words are required for compilation and loading of the program. To this number must be added the required storage for execution that can be calculated with the formula (decimal) in chapter 7 of the original paper. The source text of the program can be obtained from the author as a card-deck, punched in ASCII-029 code.

REFERENCES

- CDC (1972a): *ALGOL-60 reference manual, version 3, revision C*. Publication nr. 60329000. Control Data Corporation, Sunnyvale, California.
- (1972b): *SCOPE reference manual, version 3.4, revision D*. Publication nr. 60307200. Control Data Corporation, Sunnyvale, California.
- (1973): *ALGOL reference manual, version 4, revision A*. Publication nr. 603847000. Control Data Corporation, Sunnyvale, California.
- VOORRIPS, A. (1973): An ALGOL-60 program for the computation and graphical representation of pollenanalytical data. *Acta Bot. Neerl.* 22: 645–654.