

1 SUMMARY

This subroutine **performs a partial syntax analysis of a valid Fortran 77 statement.**

ATTRIBUTES — **Version:** 1.0.0. **Remark:** This is a rewritten version of OE06 allowing it to handle Fortran 77.
Types: OE16A. **Original date:** July 1986. **Origin:** J.K.Reid, Harwell.

2 HOW TO USE THE PACKAGE

2.1 Argument list

```
CALL OE16A(CSTAT, LEN, KIND, INF, CNAME)
```

CSTAT is a CHARACTER*1 array of length LEN which must be set by the user to contain the statement to be analysed.

The characters of columns 1 to 72 of the first card and of columns 7 to 72 of continuation cards must be placed in CSTAT(I), I = 1, 2, ..., LEN. This argument is not altered by the subroutine.

LEN is an INTEGER variable which must be set by the user to the number of characters in the statement. This argument is not altered by the subroutine.

KIND is an INTEGER variable which need not be set by the user. It is set by the subroutine to zero if the statement is not recognized, or else to a positive value between 1 and 32 to identify the type of statement. The following statements are recognized:

1	Comment
2	FORMAT
3	Arithmetic assignment to an array element or arithmetic statement function
4	Arithmetic assignment to a scalar
5	STOP or CALL EXIT
6	RETURN
7	CALL (other than CALL EXIT)
8	DO
9	CONTINUE
10	GO TO (assigned or unconditional)
11	GO TO (computed)
12	IF (logical)
13	IF (arithmetic)
14	IF (...) THEN
15	ELSEIF (...) THEN
16	ELSE
17	ENDIF
18	PROGRAM
19	SUBROUTINE
20	FUNCTION
21	ENTRY
22	BLOCK DATA
23	IMPLICIT
24	READ
25	WRITE
26	REWRITE (IBM extension)

27	OPEN
28	CLOSE
29	INQUIRE
30	BACKSPACE
31	END FILE
32	REWIND
33	END

INF is an INTEGER array of length 6 which need not be set by the user. On output

INF(1)	holds the value of the statement label, or zero if no label,
INF(2)	points to the first left bracket, or zero if none,
INF(3)	points to the right bracket matching the first left bracket, or zero if none,
INF(4)	holds the value of the target label of a DO statement, or zero for any other statement,
INF(5)	holds zero unless the statement is an input/output statement (KIND = 23, ..., 31) with an ERR= specifier, in which case it holds the associated label,
INF(6)	holds zero unless the statement is a READ statement with an END= specifier, in which case it holds the associated label.

CNAME is a CHARACTER*6 variable, which need not be set by the user. It is set by the subroutine to hold the subroutine, function, entry or program name (for KIND = 17, ..., 21).

2.2 Errors and diagnostic messages

There are no error returns. However, if the statement is not recognized, KIND will be set to zero. The subroutine assumes that the statement is valid Fortran 77.

3 GENERAL INFORMATION

Workspace: None.

Use of common: None.

Other routines called directly: OE16A calls OE16B, which never needs to be called directly by the user.

Input/output: None.

Restrictions: None.

4 METHOD

An initial test looks for a 'C' or '*' in column 1 or a totally blank statement, and returns with KIND set to 1 if there is. Otherwise the label, if any, is calculated, and the brackets found. This is done by scanning CSTAT for the first '(' character and then counting all the subsequent left and right brackets until the numbers of each are equal. The last right bracket found matches the first left bracket. During this process all strings are skipped over, so that any brackets that may be contained in them are not counted.

The statement is then tested for being an assignment, and a return is made if it is. If not, a test is made for each keyword in turn. The number of tests is reduced by first getting the initial letter, and jumping to the corresponding batch of keyword tests. If appropriate, the program, subprogram, or entry name is read into array NAME, before control is returned to the calling program with KIND and INF set.