1 SUMMARY

To sort an **array of numbers** into **ascending order.** The 'Quicksort' algorithm is used, see, C.A.R. Hoare, 'Quicksort', Computer Journal, April 1962.

ATTRIBUTES — Version: 1.0.0. (12 July 2004) **Types:** Real (single, double), Integer. **Original date:** April 1980. **Origin:** C.Birch*, Harwell.

2 HOW TO USE THE PACKAGE

2.1 The argument list and calling sequence

Sorting single precision numbers

```
CALL KB05A(ARRAY,N)
```

Sorting double precision numbers

```
CALL KB05AD(ARRAY,N)
```

Sorting integer numbers

```
CALL KB05AI(ARRAY,N)
```

`ARRAY` is an **array** containing the numbers to be sorted and the user must put these in `ARRAY(I), I=1,N`. On return from the subroutine they will have been sorted into ascending order. `ARRAY` should be of Fortran type corresponding to the name of the sorting subroutine being used.

`N` is an `INTEGER` variable and must be set by the user to the number of numbers in the array.

3 GENERAL INFORMATION

Use of Common: none.

Workspace: private integer workspace of length 100, which limits the size of `ARRAY` to $2^{50} \approx 10^{15}$.

Other subroutines: none.

Input/Output: If $n < 1$ an error message is printed.

Restriction: $n \geq 1$.

4 METHOD

The 'Quicksort' method is used, see C.A.R. Hoare, 'Quicksort', Computer Journal, April 1962.

5 EXAMPLE OF USE

This example program sorts the N numbers in the array ARRAY into ascending order using a call to KB05AD.

```
      PROGRAM MAIN
      INTEGER N, I
      PARAMETER ( N = 10 )
      DOUBLE PRECISION ARRAY( N )
      DATA ARRAY / 1.0D0, 5.0D0, 7.0D0, 0.0D0, 4.0D0,
     *             6.0D0, 2.0D0, 3.0D0, 9.0D0, 8.0D0 /
      CALL KB05AD( ARRAY, N )
C
      WRITE( 6, "( ' reordered array = ', /, 10F5.2 )" )
     *  ( ARRAY( I ), I = 1, N )
      STOP
      END
```

This produces the following output:

```
 reordered array =
 0.00 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00
```