

NAG Fortran Library Routine Document

D03RZF

Note: before using this routine, please read the Users' Note for your implementation to check the interpretation of ***bold italicised*** terms and other implementation-dependent details.

1 Purpose

D03RZF is designed to be used in conjunction with D03RBF. It can be called from the user-supplied MONITR subroutine to obtain the number of grid points and their (x, y) co-ordinates on a solution grid.

2 Specification

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SUBROUTINE D03RZF(LEVEL, NLEV, XMIN, YMIN, DXB, DYB, LGRID, ISTRUC,
1              NPTS, X, Y, LENXY, IFAIL)
  INTEGER      LEVEL, NLEV, LGRID(*), ISTRUC(*), NPTS, LENXY, IFAIL
  real        XMIN, YMIN, DXB, DYB, X(LenXY), Y(LenXY)

```

3 Description

D03RZF extracts the number of grid points and their (x, y) co-ordinates on a specific solution grid produced by D03RBF. It must be called only from within the user-supplied subroutine MONITR. The parameters NLEV, XMIN, YMIN, DXB, DYB, LGRID and ISTRUC to MONITR must be passed unchanged to D03RZF.

4 References

None.

5 Parameters

- | | | |
|-----|---|---------------|
| 1: | LEVEL – INTEGER | <i>Input</i> |
| | <i>On entry:</i> the grid level at which the co-ordinates are required. | |
| | <i>Constraint:</i> $1 \leq \text{LEVEL} \leq \text{NLEV}$. | |
| 2: | NLEV – INTEGER | <i>Input</i> |
| 3: | XMIN – <i>real</i> | <i>Input</i> |
| 4: | YMIN – <i>real</i> | <i>Input</i> |
| 5: | DXB – <i>real</i> | <i>Input</i> |
| 6: | DYB – <i>real</i> | <i>Input</i> |
| 7: | LGRID(*) – INTEGER array | <i>Input</i> |
| 8: | ISTRUC(*) – INTEGER array | <i>Input</i> |
| | <i>On entry:</i> NLEV, XMIN, YMIN, DXB, DYB, LGRID and ISTRUC as supplied to MONITR must be passed unchanged to D03RZF. | |
| 9: | NPTS – INTEGER | <i>Output</i> |
| | <i>On exit:</i> the number of grid points in the grid level LEVEL. | |
| 10: | X(LenXY) – <i>real</i> array | <i>Output</i> |
| 11: | Y(LenXY) – <i>real</i> array | <i>Output</i> |
| | <i>On exit:</i> $X(i)$ and $Y(i)$ contain the (x, y) co-ordinates respectively of the i th grid point, for $i = 1, 2, \dots, \text{NPTS}$. | |

12: LENXY – INTEGER

Input

On entry: the dimension of the arrays X and Y as declared in MONTR.

Constraint: $\text{LENXY} \geq \text{NPTS}$.

13: IFAIL – INTEGER

Input/Output

On entry: IFAIL must be set to 0, -1 or 1. Users who are unfamiliar with this parameter should refer to Chapter P01 for details.

On exit: IFAIL = 0 unless the routine detects an error (see Section 6).

For environments where it might be inappropriate to halt program execution when an error is detected, the value -1 or 1 is recommended. If the output of error messages is undesirable, then the value 1 is recommended. Otherwise, for users not familiar with this parameter the recommended value is 0. **When the value -1 or 1 is used it is essential to test the value of IFAIL on exit.**

6 Error Indicators and Warnings

If on entry IFAIL = 0 or -1, explanatory error messages are output on the current error message unit (as defined by X04AAF).

Errors or warnings detected by the routine:

IFAIL = 1

On entry, LEVEL < 1,
or LEVEL > NLEV.

IFAIL = 2

The dimension of the arrays X and Y is too small for the requested grid level, i.e., $\text{LENXY} < \text{NPTS}$.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

See Section 9 of the document for D03RBF.
