

SET MINMAX

PURPOSE

Specify whether extreme value distributions are based on the minimum order statistic or the maximum order statistic.

DESCRIPTION

The Weibull, Extreme Value Type I (or Gumbel), and Extreme Value II (or Frechet) distributions are used to model survival times and extreme values. Such analysis can of course be based on either the minimum order statistic or the maximum order statistic. A little known fact is that each of the above distributions has 2 distinct distributional forms. One is based on the minimum while the other is based on the maximum. The distributions of the minimum and maximum based distributions have similar shapes, but are mirror images of each other. This affects probability plots and other analyses.

This SET command output affects the output of:

```
<WEIBULL/GUMBEL/FRECHET> PROBABILITY PLOT
<WEIBULL/GUMBEL/FRECHET> PPCC PLOT
<WEIBULL/GUMBEL/FRECHET> RANDOM NUMBERS
WEICDF, WEIPDF, WEIPPF
EV1CDF, EV1PDF, EV1PPF
EV2CDF, EV2PDF, EV2PPF
```

SYNTAX

```
SET MINMAX <MIN/MAX>
```

where MIN specifies that the distribution is based on the minimum order statistic while MAX specifies that it is based on the maximum order statistic.

EXAMPLES

```
SET MINMAX MIN
SET MINMAX MAX
```

DEFAULT

There is no default for this command. The analyst must explicitly specify which type of distribution is desired.

SYNONYMS

SET MINMAX 1 is a synonym for SET MINMAX MIN.

SET MINMAX 2 is a synonym for SET MINMAX MAX.

RELATED COMMANDS

RANDOM NUMBERS (LET)	=	Generate random numbers.
PPCC PLOT	=	Generate a probability plot correlation coefficient plot.
PROBABILITY PLOT	=	Generate a probability plot.

REFERENCES

“Contributions to Order Statistics,” Sarhan and Greenburg, John Wiley, 1962 (page 69).

APPLICATIONS

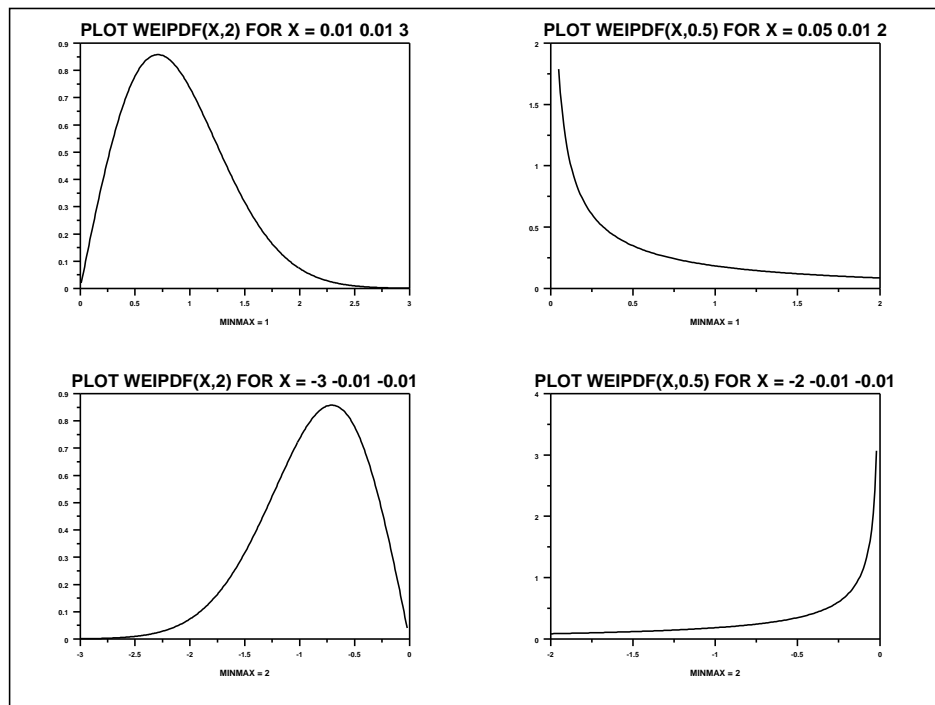
Survival and extreme value analysis

IMPLEMENTATION DATE

93/8

PROGRAM 1

```
MULTIPLY 2 2; MULTIPLY CORNER COORDINATES 0 0 100 100
TITLE AUTOMATIC
X1LABEL MINMAX = 1
X1LABEL SIZE 2.5
TIC LABEL SIZE 2.0
SET MINMAX 1
PLOT WEIPDF(X,2) FOR X = 0.01 0.01 3
PLOT WEIPDF(X,0.5) FOR X = 0.05 0.01 2
SET MINMAX 2
X1LABEL MINMAX = 2
PLOT WEIPDF(X,2) FOR X = -3 -0.01 -0.01
PLOT WEIPDF(X,0.5) FOR X = -2 -0.01 -0.01
END OF MULTIPLY
```



PROGRAM 2

```

MULTIPLY 2 1; MULTIPLY CORNER COORDINATES 0 0 100 100
SET MINMAX MIN
LET GAMMA = 3
LET Y = WEIBULL RANDOM NUMBERS FOR I = 1 1 20
.
TITLE AUTOMATIC
LEGEND SIZE 3.5
LEGEND 1 MINMAX = MIN
CHARACTER X
LINE BLANK
WEIBULL PROBABILITY PLOT Y
SET MINMAX MAX
LEGEND 1 MINMAX = MAX
WEIBULL PROBABILITY PLOT Y
END OF MULTIPLY
    
```

