TKOLMO	CERN Program Library	G103

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Submitter :
Language : Fortran

Library: MATHLIB
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Kolmogorov Test

Subroutine subprogram `TKOLMO` tests whether two one-dimensional sets of points are compatible with coming from the same parent distribution, using the Kolmogorov test. That is, it is used to compare two experimental distributions of unbinned data.

Structure:

`SUBROUTINE` subprogram
User Entry Name: `TKOLMO`
External routine referenced: `PROBKL` (G102)

Usage:

```
CALL TKOLMO(A,NA,B,NB,PROB)
```

`A,B` (`REAL`) One-dimensional arrays of length `NA`, `NB`, respectively. The elements of `A` and `B` must be given in ascending order. (This can be accomplished, for example, by using `FLPSOR` (M103)).

`NA,NB` (`INTEGER`) The number of points in `A` and `B`, respectively.

`PROB` (`REAL`) A calculated confidence level which gives a statistical test for compatibility of `A` and `B`.

Values of `PROB` close to zero are taken as indicating a small probability of compatibility. For two point sets drawn randomly from the same parent distribution, the value of `PROB` should be uniformly distributed between zero and one.

Method:

The Kolmogorov test is used. The test statistic is the maximum deviation between the two integrated distribution functions, multiplied by the normalizing factor $\sqrt{MN/(M+N)}$, where M and N are the numbers of points in the two samples.

Accuracy:

Approximately seven digits are correct.

Notes:

Probabilities smaller than 10^{-40} are set to zero. However, the method has a statistical meaning only for "large" M and $N(>10)$.

References:

1. W.T. Eadie, D. Drijard, F.E. James, M. Roos and B. Sadoulet, Statistical Methods in Experimental Physics, (North-Holland, Amsterdam 1971) 269-271.

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