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Find Histogram-Channel

IUCHAN, IUBIN, IUHIST all find the histogram-channel for a given quantity in the same way. They differ only slightly in the way in which the parameters are passed.

Structure:

FUNCTION subprograms
User Entry Names: IUCHAN, IUBIN, IUHIST

Usage:

All routines need the the following parameters:

X	(REAL) Quantity to be histogrammed.
XLOW	(REAL) Lower limit of the histogram.
DX	(REAL) Channel width.
NX	(INTEGER) Number of channels.

and they return the channel number $\mathtt{N} = (\mathtt{X} - \mathtt{XLOW})/\mathtt{DX} + 1 + \varepsilon$ normally, or $\mathtt{N} = 0$ for underflow ($\mathtt{X} < \mathtt{XLOW}$), or $\mathtt{N} = \mathtt{NX} + 1$ for overflow ($\mathtt{X} \geq \mathtt{XLOW} + \mathtt{NX} * \mathtt{DX}$).
$\varepsilon > 0$ is a small bias to counteract rounding effects when X is exactly on a bin edge, a likely and serious problem when compressed data are histogrammed.
$\varepsilon = 10^{-5}$ on 32-bit machines, $\varepsilon = 10^{-6}$ on machines with a larger word size.

Function IUCHAN:

```
N = IUCHAN(X,XLOW,DX,NX)
```

Functions IUBIN and IUHIST:

```
DIMENSION PAR(3)
EQUIVALENCE(NX,PAR(1))
LOGICAL SPILL

N = IUBIN (X,PAR,SPILL)
N = IUHIST(X,PAR,SPILL)
```

with

PAR — Histogram parameters:
$\mathtt{PAR}(1) \equiv \mathtt{NX}$
$\mathtt{PAR}(2) \equiv \mathtt{DX}$ (for IUBIN), or $\equiv 1/\mathtt{DX}$ reciprocal of the channel width (for IUHIST).
$\mathtt{PAR}(3) \equiv \mathtt{XLOW}$

SPILL — (LOGICAL) Flag set to .TRUE. or .FALSE. depending on whether X is outside or inside the histogram.

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