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Submitter :
Language : Fortran or Assembler

Library: KERNLIB
Submitted: 28.01.1971
Revised: 16.09.1991

Handling Packed Vectors of Bytes

PACBYT allows handling of packed vectors of bytes. Any such vector consists of a string of bytes, all of NBITS bits, INWORD of them packed into one computer word, stored from right to left.

Structure:

SUBROUTINE and FUNCTION subprograms
User Entry Names: PKBYT, UPKBYT, JBYTPK, SBYTPK
External References: JBYT (M421), SBYT (M421) (Fortran version)

Usage:

The 2–word vector MPACK specifies the packing parameters:

```
MPACK(1) = NBITS
MPACK(2) = INWORD
```

$\mathtt{MPACK}(1) = 0$ is accepted as specifying both $\mathtt{NBITS} = 1$ and INWORD equal to the number of bits per word on the given computer.

```
CALL PKBYT(IB,MX,JX,N,MPACK)
```

packs the N–word vector IB of small integers into the bytes JX,JX+1, ... ,JX+N-1 of the byte-vector MX.

```
CALL UPKBYT(MA,JA,IY,N,MPACK)
```

unpacks the N bytes JA,JA+1, ... ,JA+N-1 of the packed byte-vector MA into the vector IY of small integers.

```
IX = JBYTPK(MA,JA,MPACK)
```

fetches the JA-th byte from the packed byte-vector MA.

```
CALL SBYTPK(IT,MX,JX,MPACK)
```

sets the first byte from IT into the JX'th byte of the packed byte vector MX.

Notes:

1. These routines, and the manner of packing byte-vectors, is compatible with the routines JBYT and SBYT (M421), except that there the *location* of a byte in the word is specified, whereas here the *ordinal number* of a byte in the vector has to be given. The conversion is as follows:

   The byte with ordinal number J is found in word $\mathtt{JW} = (\mathtt{J} - 1)/\mathtt{INWORD} + 1$,
   on byte $\mathtt{JB} = \mathtt{J} - (\mathtt{JW} - 1) * \mathtt{INWORD}$ starting at bit $\mathtt{L} = (\mathtt{JB} - 1) * \mathtt{NBITS} + 1$.

2. Bits and bytes are numbered from right to left within one and the same computer word; across a word boundary there is a jump from the most significant part of the current word to the least significant part of the next word.

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