HASHE$ – Calculate File Hash Total (Extended)

The HASHE$ routine can be used to calculate a simple Hash Total for a Global or Windows file.

1. Invocation

To calculate the file hash total code:

    CALL HASHE$ USING *fd hash file_address file_length*

where fd is a **closed** OR$98 or OR$98X FD containing the name of the file. The 32-bit hash value is returned in the PIC X(4) hash field. The file_address and file_length fields are both PIC 9(9) COMP variables.

2. STOP Codes and Exception Conditions

No STOP codes are generated by HASHE$.

The following EXIT codes may be returned by HASHE$:

EXIT code	$$COND	Description
12506	6	The file specified in the OR$98 or OR$98X FD could not be opened.
12507	7	The file specified in the OR$98 or OR$98X FD could not be read.
12508	8	Unable to create buffer in free memory.

3. Programming Notes

HASHE$ calculates the Adler-32 checksum by calculating two 16-bit checksums and concatenating their bits into the 32-bit result. The first 16-bit checksum, A, is the sum of all bytes in the string plus one. The second 16-bit checksum, B, is the sum of the individual values of A from each step.

At the beginning of an Adler-32 run, A is initialized to 1, B to 0. The sums are done modulo 65521 (the largest prime number smaller than 2^{16}).

The function may be expressed as:

$$A = 1 + D_1 + D_2 + \ldots + D_n \ (\text{mod } 65521)$$
$$B = (1 + D_1) + (1 + D_1 + D_2) + \ldots + (1 + D_1 + D_2 + \ldots + D_n) \ (\text{mod } 65521)$$
$$= n \times D_1 + (n-1) \times D_2 + (n-2) \times D_3 + \ldots + D_n + n \ (\text{mod } 65521)$$

$$Adler\text{-}32(D) = B \times 65536 + A$$

where D is the string of bytes for which the checksum is to be calculated, and n is the length of D.

4. Examples

[EXAMPLES REQUIRED]

5. Copy-Books

None.

6. See Also

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HASH$      Calculate Hash File Total
HASHX$     Calculate File Hash Total
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