Subject: Extension to DOT_PRODUCT
From: Van Snyder

1 Introduction

I occasionally need to compute SUM(A*B*C) or SUM(A*B*C*D) or . . . . I have met several processors that form an array temp for the argument. I have not met a processor that forms an array temp during evaluation of DOT_PRODUCT. So that one could have (some) confidence that processors would evaluate SUM(A*B*C) etc. without forming an array temp, an extension to DOT_PRODUCT would be useful.

2 Requirement

Provide syntactic sugar that encourages a processor to evaluate SUM(A*B*C) etc. without forming an array temp.

3 Detailed specification

Extend DOT_PRODUCT to have up to 26 arguments. In the case of numeric arguments, it computes SUM(VECTOR_A*VECTOR_B*VECTOR_C) etc. In the case of logical arguments it computes ANY(VECTOR_A.AND.VECTOR_B.AND.VECTOR_C) etc.

4 Syntax

No new syntax, and no changes to existing syntax.

5 Edits

Edits refer to 04-007. Page and line numbers are displayed in the margin. Absent other instructions, a page and line number or line number range implies all of the indicated text is to be replaced by associated text, while a page and line number followed by + (-) indicates that associated text is to be inserted after (before) the indicated line. Remarks are noted in the margin, or appear between [and] in the text.

[Editor: Insert "[, . . . VECTOR_Z]" after "VECTOR_B".] 297:2

13.7.32 DOT_PRODUCT (VECTOR_A, VECTOR_B [, . . . VECTOR_Z]) 313:16

[Editor: Insert "a generalization of" after "Performs".] 313:17

VECTOR_B . . . shall be of numeric type if VECTOR_A is of numeric type and of logical type if VECTOR_A is of logical type. They shall be rank-one arrays of the same size as VECTOR_A. There shall not be more than two arguments if VECTOR_A is of complex type. 313:21

[Editor: Insert "[*. . . VECTOR_Z]" after "VECTOR_B" twice.] 313:23,29

[Editor: Insert "[.AND. . . . VECTOR_Z]" after "VECTOR_B" twice.] 313:25,34

Examples. 314:1

Case (i): DOT_PRODUCT ((/1,2,3/),(/2,3,4/)) has the value 20.

Case (ii): DOT_PRODUCT ((/1,2,3/),(/2,3,4/),(/3,4,5/)) has the value 90.