Public Review Comment #18

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Public Comment on CD 1539-1 (Fortran)
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Comment on the use of square brackets for array constructors

For the following reasons I strongly oppose an alternative, redundant and thus superfluous notation for array constructors in general and the use of square brackets for this purpose in particular:

1. There is absolutely NO technical reason why Fortran should need yet another purely syntactic variant of an existing, well established and perfectly good notation (there are too many ways to say the same things already) --- especially since the proposed syntax is really a purely LEXICAL variant of a notation that was only introduced by the Fortran 90 standard (the beginning of the "modern" era for Fortran).

Indeed, just two simple global change commands in any editor will suffice to perform this local, context-free transformation: '[' -> '(/' and ']' -> '/)' --- if you are willing to accept that these changes will also be made in character literals and in comments.

2. Most syntactic variants were introduced into Fortran in order to improve the readability, reliability and security of Fortran code, not just the notation of an old (F66 or F77) feature/concept. In fact, they often led to important generalizations or other substantial enhancements of the functionality of the language. Noteworthy examples of this are ends of DO loops (and other block-structured syntax elements), attributes in type declarations, kind parameters, etc. .

In the present case I cannot discern an enhancement of the existing language in any respect. Also, the proposed use of square brackets is highly unvonventional in mathematics and unusual in general programming languages (specialized mathematical systems such as Maple are an exception).

3. The Fortran committees have repeatedly rejected new ways of saying the same thing, especially if it was only a different spelling.

The long discussions about CONSTANT as an alternative spelling for the PARAMETER attribute spring to mind. It was rejected in the late phases of defining Fortran 90, and I believe it was discussed and rejected again for Fortran 95.

4. Some of the most popular languages around, among them C, C++, and Java, use CURLY BRACES { } to enclose the array elements in an array notation, and that is not the only use of braces in these languages.

In these and many other languages since Algol 60, square brackets [ ] are used for array dimensioning and indexing, but NOT for array construction. Pascal also uses square brackets to construct sets, but not arrays (Pascal does not provide array constructors). Modula-2 does not provide array constructors either, but switches to braces for set construction, having discontinued the use of braces for comments. Square brackets are used for subrange types and for array indexing in Modula-2.

Interestingly enough, Ada folows the example of Algol 68 and uses normal parentheses ( ) for array constructors. However, this is not an option in Fortran since it would result in ambiguities.

5. Array constructors were only introduced into Fortran through the Fortran 90 standard, and the decision then was that Fortran (or computers or the world) were not ready to use previously unused characters for this purpose.

What has changed since the late 80's? Not much, I would say, except that the percentage of systems that do not have square brackets and curly braces in their character set has dwindled even further.

Is that a reason to use these characters now? Not necessarily, but their use should certainly be considered.

If Fortran really wants to, after almost 50 years of existence, start using these "new" characters, then it should do so very carefully and very deliberately, and with the consciousness that [ ] and { } are probably the ONLY bracketing characters besides ( ) there will ever be (for all practical purposes).

Does Fortran really want to waste one of these two pairs of symbols on a redundant notation, thus precluding much more interesting uses, e.g. in parallel and high performance computing, for intervals, etc. ?

I do not see Fortran ready to take this historic step at this time. Before making such an irreversible decision, I would like to see a thorough investigation and discussion of the potential uses of these "precious" symbols.

With best regards,

Wolfgang Walter

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