On oversights in specification

Among the comments I received on my article "On Formalism in Specifications" (Software, Jan. 1985), two mention errors that should be corrected. I also use this opportunity to correct another oversight.

The first error was pointed by Eric A. Sosman of Atex, Inc., in Bedford, Massachusetts. In the definition of subsequences (page 19, box), one should use a strictly sorted sequence of integers, not just a sorted sequence. The definition of "strictly sorted sequence" is like the one given for "sorted sequence," with ≤ replaced by <. Without this correction, the sequence <a,b,c>, say, would be acceptable as a subsequence of the example given, <a,b,a,b,d,c,d>, obtained with the sorted sequence of integers <7,7>; this is clearly incorrect.

The second oversight is in the "more concise notation" given on page 19 for the general definition of a function satisfying a given specification. The definition on the bottom of page 16, third column, is correct, but the more abstract form on page 17 is a bit too concise indeed; instead of just sol C goal, the second condition of that definition (line 6), should read sol | dom (goal) < goal, where the left-hand side denotes the restriction of function sol to the domain of relation goal. Ali Mili, from the University of Tunis, who pointed out this oversight, mentions an elegant version of the complete definition, credited to Harlan Mills from IBM: dom (goal) = dom (sol≥ goal). This also gives me an opportunity to mention that Mill's paper, "A Relational Approach to the Design of Deterministic Programs," Acta Informatica, Vol. 20, No. 4, 1983, pp. 315-328, introduces a theory of programs directly related to the discussion in my article.

I noticed the third error too late to have it corrected; it doesn't seem to have been caught by anyone else. The article incorrectly states on page 18, second column, second paragraph, that MAX_SET may not be defined if the set X is infinite, because f may then have no maximum. If this is the case, the result of MAX_SET is not undefined: it is just the empty set. Fortunately, this error is of no consequence on the rest of the paper, although it implies that the end of the same paragraph and the first paragraph on page 19 should be slightly reworded.

It seems fair to point out that these three oversights are rather minor, and that the first two belong to the general supporting material, not to the specification proper. Still, as Sosman obligingly quotes from the article itself, "one has to be pedantic on such matters." Although one cannot expect all specifications to be read by an audience as large as that of Software, it is clear that they should be critically analyzed by as many people (and automatic consistency checking tools) as possible. The mathematical approach to specification advocated in the article ensures that a common, well-understood notation is used as a basis for this review process, thus enhancing the likelihood that an oversight will be caught before it entails any serious consequence.

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