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Arithmetic Standard

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ACTION: For review and comment as appropriate
by SC22 Member Bodies.

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To:
Chairmen of Language Working Groups
Chairmen of National Language Working Groups

Our ref: ww170-117-4973.le

Amsterdam, June 6th, 1990

Re: Review of the Language Compatible Arithmetic Standard

Dear Colleague,

As acting convenor of WG11, it is my pleasure to forward to you the current draft of the above standard (LCAS) for your consideration.

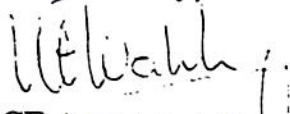
Almost all the work of WG11 impacts other programming language standards, and LCAS is no exception. We believe that LCAS fills an important gap between the programming language standard and the underlying machine upon which implementations rely. Because of the very close interaction with programming languages, we think that the SC22 language groups should study this proposal carefully.

Similarly, national standards bodies should also study this, especially if some national standard could be later adopted as an international standard.

You will note that LCAS explicitly does not address some related areas of concern. WG11 is separately proposing to address the area of mathematical procedures and complex arithmetic. These two additions would rely upon LCAS.

Hence WG11 would be very grateful if your group (or someone representing your group) could spend some time to study LCAS. Any views on the matter are very welcome.

Yours sincerely,



ACE Associated Computer Experts bv
Willem Wakker, acting convenor ISO/IEC JTC1/SC22/WG11

Notes on Potential Changes to the Language Compatible Arithmetic Standard

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May 31, 1990

Attached to this note is the current version of LCAS. This version has the same technical content as the versions which appeared in January 1990 in SIGPLAN Notices and the SIGNUM Newsletter. (The changes were to conform to the ISO Guidelines.)

WG11 is very anxious to have this proposal reviewed by the very large community to which it is relevant, namely those who wish to ensure that numerical computations are performed 'correctly' by computers. However, we have already identified some possible changes which we list below with our tentative conclusion. Your views on these aspects are very welcome. Naturally, until we have the views of all of those concerned, we cannot exclude any other changes.

Unbounded integers It has been suggested that unbounded integer data types should be allowed. We are in favour of this addition.

Two's complement floating point The current wording does not permit this form of floating point. Since allowing this would mean that overflow can occur in more operations, and few computers have this form of floating point, we are not in favour of this.

Very unbalanced exponent ranges Technically, this is not a desirable feature and hence we are inclined against allowing this.

Optional operations These additional operations (mainly for floating point) are easy to implement and convenient in some circumstances, and therefore the standard would be more useful if they were mandated. Hence we support this.

Language annexes We acknowledge that more work is required here (although they are only informative). This should clearly be done in conjunction with the relevant language groups.

Proposal for a Language Compatible Arithmetic Standard

Version 2.2a

Draft of May 31, 1990

Accredited Standards Committee X3, Information Processing Systems,
operating under the procedures of the American National Standards Institute

An identical standard is being submitted to the International Standards Organization.

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Foreword

This International Standard was prepared for ISO/IEC JTC1/SC22/WG11, with assistance from national bodies detailed in annex A.

The New Work Item for this International Standard has only just been approved by JTC1, and therefore this document has no formal international status.

This International Standard does not replace any existing standard but supplements the existing programming language standards (see the Introduction).

All the annexes to this International Standard are informative.