
Subject: Re: How Computers Represent Floats
Posted by [colinr](#) on Fri, 01 Dec 2000 08:00:00 GMT
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On Thu, 30 Nov 2000 13:23:41 -0700,
William B. Clodius <wclodius@lanl.gov> wrote:

>
>
> "William B. Clodius" wrote:
>> <snip> IEEE 754 requires that all intermediate calculations
>> be performed a higher precision so
> Ignore the above incomplete sentence. What I originally attempted to
> write was covered later.
>>
>> <snip>
>
> Some other surprises.
>
> The definition of the IEEE 754 mantisa, an integer with values from
> 2^{n_mant} to $2^{n_mant}-1$, where n_mant is the number of bits available
> for the mantisa, is termed a normalized number. This is error prone for
> very small numbers. IEEE 754 mandates that there be available for such
> small numbers what are termed denorms where the mantissa is interpreted
> as an integer from 0 to 2^{n_mant} , so that accuracy degrades gradually
> for such values. However, this complicates the implementation of the
> floating point, so some processors, e.g., the DEC Alpha make this
> available only in software at a greatly reduced performance.

This sounds like it relates to my most recent problem - generating
real input files with IDL for a DEC Alpha fortran program. The
fortran program had big problems manipulating small numbers
generated by the IDL and I had to pepper the IDL code with WHERE
statements to set all very small numbers to zero. Has anyone else
seen stuff like this?

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