

Re: how to list all of the real numbers

Source: <http://sci.tech-archive.net/Archive/sci.math/2007-08/msg00586.html>

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 - *Date:* Fri, 03 Aug 2007 11:01:01 -0400
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Everyone needs to calm down here. If you read Calvin's original post, his real numbers are represented by *paths* in a binary tree. He acknowledges that there are uncountably many such paths:

Thus each endless path corresponds to a real number, and every real number is represented by a path. Some of the reals are represented by more than one path [...]

As is well known, the number of paths is uncountable, though the number of nodes is countable.

The word "list" might be misleading, since that usually implies an enumeration by the natural numbers.

Calvin also notes that one can get any real number to finite accuracy in a finite number steps:

Thus, amazingly enough, we can list ALL of these reals at once, to any desired binary place, simply by working on the tree, from left to right, row below row of nodes, for a finite number of steps. And we can calculate that number of steps.

'All at once' is misleading, of course, since multiple reals occupy the same paths to whatever desired binary place we choose to stop. But they're all there.

I do not share Calvin's amazement, however. To many of us here, the method he proposes is nothing new.

I have the impression that Calvin is earnestly learning about uncountability and such, and he is sharing his ways of thinking about the issue. He does not strike me as a crank who, for example, insists that the reals must be countable.

The topic of uncountability is so often brought up by cranks that it is very easy to miss the sincerity of non-cranks. (Is there a better word than that?) I think we ought to be careful not to discourage those who come to learn.

Re: how to list all of the real numbers

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