

Re: abundance of irrationals!)

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- *From:* Tony Orlow (aeo6) <aeo6@xxxxxxxxxxxx>
 - *Date:* Tue, 10 May 2005 16:14:03 -0400
-

Russell said:

> aeo6 Tony Orlow wrote:

>> Russell said:

>>> aeo6 Tony Orlow wrote:

>>>

>>> [snip]

>>>

>>>> Excuse me, but the nodes of an infinitely deep binary tree can

>>> obviously be

>>>> enumerated in a linear manner, corresponding to binary integers

> and

>>> thus to the

>>>> naturals.

>>>

>>> Yes.

>>>

>>> If you want to complain that it would require infinite digits for

>>>> most values,

>>>

>>> Huh? What does that even mean? What values are you

>>> talking about? And digits of what?

>> Duh. The digits of the binary number that represent each node on the

> tree,

>

> Ok; if that's what you mean, then each node on the tree

> is represented by a **finite** sequence of digits.

The tree has infinitely long branches, so no, you're wrong.

>

>> where each bit represents a right or left branch as a 0 or 1.

> Infinite strings

>> of such digits represent elements infinitely far out on the branches.

>

> Infinite strings represent **paths**. Not nodes.

Ahem! Each node is DEFINED by its path from the root. The binary string represents the node reached by following the path specified by the 1's and 0's.

> You talk

> about elements (nodes, I assume) that are "infinitely far

> out", as if they exist. But they don't! Every node in the

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> tree is a finite distance from the root.

Uh, yeah, in an infinite set of nodes. That makes sense, not. The number of nodes is $(2^n)-1$, where n is the number of levels. In order for $(2^n)-1$ to be infinite, n must be infinite. You require an infinite number of levels to contain paths to infinite nodes, and therefore need infinite digits to define your nodes.

>

> What did

>> you think, when I referred to correspondence between the nodes of a

> binary tree

>> and binary integers?

>

> Well, if you had said "nodes" instead of "values", I could

> simply have told you that you were wrong, as I am doing now.

> I was giving you the benefit of the doubt.

Yeah, that's very nice of you, except that YOU'RE wrong. What finite number of levels, what finite length of binary string, do you need to include an infinite set of nodes?

>

>>>

>>>> that's irrelevant. it's still an enumeration of the reals.

>>>>

>>>> No. The obvious linear enumeration of *nodes* is not an

>>>> enumeration of the reals. For that, you need to enumerate

>>>> the different paths. That's not merely a rearrangement of

>>>> the enumeration of nodes; if you think it is, then please

>>>> tell us how you associate each node with one and only one

>>>> path. Can't be done.

>> Each bit enumerates a step in the choice of path. Think about it.

>

> Yes, I did. Now *you* think about it. If the path leads

> to a node and ends there, that path identifies the node.

> But if the path has no end, what node does it identify?

One of the nodes infinitely far out on one of the infinite branches required in order for you to include an infinite number of nodes in your tree.

>

> There are *more* paths than there are nodes.

That is incorrect.

>

> [snip]

>

>

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Smiles,

Tony

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- *Follow-Ups:*

- ◆ *Re: abundance of irrationals!*
◇ *From:* Russell

- *References:*

- ◆ *Re: abundance of irrationals!*
◇ *From:* mueckenh
- ◆ *Re: abundance of irrationals!*
◇ *From:* Randy Poe
- ◆ *Re: abundance of irrationals!*
◇ *From:* Randy Poe
- ◆ *Re: abundance of irrationals!*
◇ *From:* mueckenh
- ◆ *Re: abundance of irrationals!*
◇ *From:* Virgil
- ◆ *Re: abundance of irrationals!*
◇ *From:* mueckenh
- ◆ *Re: abundance of irrationals!*
◇ *From:* Randy Poe
- ◆ *Re: abundance of irrationals!*
◇ *From:* mueckenh
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◇ *From:* Randy Poe
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◇ *From:* aeo6
- ◆ *Re: abundance of irrationals!*
◇ *From:* Russell
- ◆ *Re: abundance of irrationals!*
◇ *From:* aeo6
- ◆ *Re: abundance of irrationals!*
◇ *From:* Russell

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