

Re: Cantor and the binary tree

Source: <http://sci.tech--archive.net/Archive/sci.math/2005-06/msg02184.html>

- *From:* Virgil <ITSnetNOTcom#virgil@xxxxxxxxxxx>
 - *Date:* Tue, 14 Jun 2005 16:30:17 -0600
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In article <1118776231.084068.76250@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx>, mueckenh@xxxxxxxxxxxxxxxxxxx wrote:

- > Virgil wrote:
- >
- >>> Double the number of nodes. The set of nodes remains countable. One of
- >>> the nodes is always related to a path turning right, the other one to a
- >>> path turning left. Your idea does no longer apply.
- >>
- >> Yes it does, since doubling the number of nodes must double the number
- >> of paths as well, unless WM wants all those new nodes to be sitting out
- >> in the open with no tree at all to shelter them.
- >
- > Yes, every split point is equipped with two nodes. The set of these
- > nodes remains countable. Every edge gets bijected to such a node.

Pointless. That the set of branches (edges?) is countable is not in dispute, but m has still not provided any mechanism to demonstrate his alleged bijection between the set of nodes (or branches) and the set of paths, much less provide anything but his allegation that it is a bijection.

Every
> bunch (= set) of paths which has its own edge also has its own node.

Which edge?
Which node?

While it is true that for each set of at least two paths, there will be a "last" node at which they all agree (at which none of them have "separated" from any of the others), for each such node there are uncountably many sets of paths for which that node is the "last" node.

- > Paths which do never separate in the tree do never separate by their
- > binary representation. They are not different paths, not different
- > representations, not different numbers.

Paths which are only one path are only one path! Big surprise!

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>
> Irrational numbers do not exist.

Can squares no longer can simultaneously have edges and diagonals or is it just that squares can no longer exist at all?

>
>
>> Is "bunch" a new technical word? How does a "bunch" of paths differ from
>> a set of paths?
>
> bunch of paths is the same as set of paths.
>>
>> And how do "separated" paths differ from other paths?
>
> They have at least one different edge.

In a maximal binary tree, there is no path that has any "edge" (branch) that it does not share with infinitely many other paths

Taking as a subtree that part of such a tree from any node onward gives a tree isomorphic to the original.

>>
>>
>>> The nodes are denoted by capitals, the
>>> paths by small letters. Start at the root A. The edge A-->B contains
>>> all paths.
>>
>> Wrong already, since from any node, including the root node, there are
>> TWO branches to its two child nodes. So neither branch can only contain
>> more than "half" of the paths.
>
> In order to get rid of the term nodes + 1, I assigned one node to the
> root, see below.

The root is already a node.

>>
>>> Node A is mapped on one of them. Call that path a.
>>> The set of all path splits off at node B. That subset which does not
>>> contain a must contain at least one path. Call that path b. Node B is
>>> mapped on path b.
>>> The set of these path splits off at the next node, say C. That subset
>>> which does not contain path b must contain at least one path. Call that
>>> path c. Node C is mapped on path c.
>>> The same is valid for the other subset containing a. There is no subset
>>> possible without a node.
>>>
>>> A
>>> /
>>> B
>>> /\
>>> C D

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>>> /\ \\
>>>
>>> This mechanism remains as long as a subset of paths contains at least
>>> one path.
>>> There cannot exist any subset of paths without one node.
>
> Make it easier: The edges form a countable set. Bunches of paths which
> are not separated, i.e., which have not at least one edge of their own
> in the tree, do not exist as individuals.

Is it the "bunches" or the "paths" that WM is alleging do not exist as individuals?

If WM is speaking of paths, then the a maximal binary tree, by his standards, has no paths at all, since no path exists in a maximal binary tree which does not share each "edge" with some other path, though the particular other path depends on which "edge" is to be shared.

It is only in trees in which all paths are finite, have leaf nodes, that one can be sure that each path has an edge not shared with any other path.

WM's finiteness of imagination again stumbles on the implications of infinity.

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• *Follow-Ups:*

- ◆ **Re: Cantor and the binary tree**
◇ *From:* ae06
- ◆ **Re: Cantor and the binary tree**
◇ *From:* mueckenh

• *References:*

- ◆ **Re: Cantor and the binary tree**
◇ *From:* Virgil
- ◆ **Re: Cantor and the binary tree**
◇ *From:* mueckenh
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◇ *From:* Virgil
- ◆ **Re: Cantor and the binary tree**
◇ *From:* mueckenh
- ◆ **Re: Cantor and the binary tree**
◇ *From:* Randy Poe
- ◆ **Re: Cantor and the binary tree**
◇ *From:* mueckenh
- ◆ **Re: Cantor and the binary tree**
◇ *From:* Martin Shobe
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