

# Re: An uncountable countable set

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- *From:* Tony Orlow <[aeo6@xxxxxxxxxxxx](mailto:aeo6@xxxxxxxxxxxx)>
  - *Date:* Sat, 19 Aug 2006 15:44:24 -0400
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Virgil wrote:

In article <[1155999688.567981.312170@xx](mailto:1155999688.567981.312170@xx)>, mueckenh@xxxxxxxxxxxxxxxxxxxx wrote:

Dik T. Winter schrieb:

> Why then did you want to allow to assign finite sequences of edges only?

To simplify matters. Natural numbers have in any base notation a finite number of digits. In allowing finite sequences of digits I allow for the occurrence of (for instance) both 0 and 00 and 000. So I give you more freedom.

But in fact that is less freedom because the sequence of edges per path is infinite.

The sequence of edges leading up to any edge is finite. So a finite sequence of 0's and 1's, 0 for left child, 1 for right child, uniquely identifies each edge, but it takes an endless sequence of 0's and 1's to identify any endless path.

Thus in infinite binary trees, the set of edges is countable but the set of endless paths is not.

Ah yes, we've been over this. Since one extra path is created for every two edges added to the tree, there are clearly half as many paths as edges (floored, for a balanced tree, of course). It is unconscionably stupid to regard the number of paths as being "uncountable" and therefore greater than the "countable" number of edges, when clearly there are fewer paths than edges once the first three nodes are added to the root node, or binary point. The proof you have offered in the past is dishonest in the sense that it bijects the edges with the naturals using one interpretation of the tree, and then bijects the paths with the reals using another incompatible interpretation. Yes, we've been all through this. Thanks for the reminder. It's an example for my

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book. An example of what sucks with transfinite set theory. Have a nice day! ;)

TO

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