

Re: Well Ordering the Reals

Source: <http://sci.tech-archive.net/Archive/sci.math/2005-12/msg00067.html>

- *From:* Tony Orlow <aeo6@xxxxxxxxxxxx>
 - *Date:* Wed, 30 Nov 2005 10:46:32 -0500
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Virgil said:

> In article <MPG.1df62e22f9ea958f98a781@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>,
> Tony Orlow <aeo6@xxxxxxxxxxxx> wrote:
>
>> Virgil said:
>>> In article <MPG.1df54787db39f44598a77d@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>,
>>> Tony Orlow <aeo6@xxxxxxxxxxxx> wrote:
>>>>
>>>> Virgil said:
>>>>>
>>>>> How many digits are indicated by "..."? Is it always the same amount?
>>>>>>
>>>>>> What about 1:000...000
>>>>>> versus 1:000...000...000
>>>>>> versus 1:000...000...000...000?
>>>>>>
>>>>> No, "... " is generic, but when comparing two strings the ellipses are
>>>>> considered to represent the same set of bit positions, and the strings
>>>>> are
>>>>> assumed to be of same length, or a substring defined which is the length
>>>>> of
>>>>> the other string. Then it works fine.
>>>>
>>>>
>>>> But suppose it is impossible to represent the two strings this way?
>>>>
>>>> Then the numbers are not well-formed.
>>>>
>>>>
>>>> That does not prevent them from being "numbers" in TO's dream world.
>>>> So apparently TO's "number system" contains numbers which defy
>>>> comparison for size.
>>>>>
>>>>> TO is assuming that whenever two strings are to be compared this is
>>>>> possible, but without some mechanism to compare the relative
>>>>> positions of arbitrary digits, this is not possible.
>>>>>
>>>>> If you do not specify the number of bits, then you don't know what number you
>>>>> are talking about in the first place

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>
> Then precisely how does one specify the "number of bits"? That has been
> my question all along!
I answered it. Maybe you haven't gotten to that post yet. One defines the number of bits as a formula using N , such as $\log_2(N)$ bits in $1:000\dots000$ denotes N , $\log_2(N)-1$ bits denotes $N/2$, $N/2$ bits denotes \sqrt{N} , N bits denotes 2^N , etc. etc.

>
>
>
>> but it is not necessary to know the
>> exact
>> number in order to compare it with another number. It is only necessary to
>> determine which has the most significant 1 bit where the other has a 0.
>> Depending on how you define your numbers, this may not always be
>> possible, but such numbers are not well-formed.

>
> One issue is how TO defines HIS numbers, as they are not numbers by
> anyone else's standards. And the second is, how does TO know that his
> "numbers" are orderable if there are such ill formed numbers that defy
> comparisons?
Those numbers are not part of the set. Can I say that the normal binary system doesn't work because you can't tell me what $10100.10100.00100$ is? You would say that's not a number in that system. Well, $\dots010101$ is not a T-riffic number. It could be $1:010\dots0101$ or $0:10101\dots0101$, and we have no idea of the number of bits, so it is not specified correctly. That doesn't make $1:0101\dots0101$ ill-defined. It's $4N/3$ (really $(4N-1)/3$, since there is another $1/3$ not included, to the right of the binary point).

>
>>>
>>> So that TO must provide a mechanism to compare the relative position of
>>> any two digits in any two strings if his imaginings are to be viable.

>
>> The digit positions we define in the infinite string are going to be
>> formulaic
>> expressions of N , like $N/2$ or $\log_2(N)$, not finitely defined positions, unless
>>> you are talking about finite values. But, given these anchor points, we can
>>> then deal with any finite number of bits clustered round those points.

>
> Since N is a variable to TO, digit positions which are variable can
> hardly serve as "anchor points".

In a relative sense, indeed they can, my friend!

>
> The issue is whether there is a mechanism to compare sizes of any two
> given "TO-numbers" or not. Apparently not.
If you give two actual T-riffic numbers, they can always be compared.

>
> Since there is such a method for natural numbers, TO-numbers are
> unnatural.

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Oh they are not only natural, but truly organic. But since you live on Tang and potroast-in-a-tube, you wouldn't understand that.

>>>

>>> TO has not done that, and give no evidence of being able to do that.

>> No, of course not.

>>>

>

—

Smiles,

Tony

<http://www.people.cornell.edu/pages/aeo6/WellOrder/>

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• *Follow-Ups:*

◆ *Re: Well Ordering the Reals*

◇ *From:* Virgil

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