Re: infinity

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* *From*: Tony Orlow (aeo6) <aeo6@xxxxxxxxxxx>
* *Date*: Wed, 31 Aug 2005 16:26:59 −0400

Randy Poe said:
> The misunderstanding in this post seems to be a confusion
> between the list of words in a language, and the properties
> of any given word in the language.
>
> Tony Orlow (aeo6) wrote:
> > Randy Poe said:
> > > This:
> > > > finite language has no upper bound if the string length has no upper bound,
> > >
> > > directly contradicts this:
> > >
> > > > if the string length is strictly finite, then so is the language.
> > >
> > > If the words have no upper bound, if counting words will never
> > > get to the end, then the list of words is not finite and the
> > > language is not finite.
> > Will adding characters to a string have an upper bound, or ever get to the
> > "end"?
>
> Each string ends. When I add one character to string X,
> of length L(X), I have created a different word in the
> language of length L(X)+1. X is still there, it is still
> of finite length, its length is still L(X).
>
> Do you agree that when I add a character to a finite
> string, I still have a finite string?
yes, when you add a finite number of characters to a finite number of
characters the sum is finite. If I can do this forever without bound, then I
can add an infinite number of characters, and the string is no longer finite.
>
> > No? The the strings are not finite, either.
>
> That doesn't follow. All you told me is that the sequence
> of lengths L, L+1, L+2, doesn't end. How does it follow
> that "therefore" the strings of length L are infinite,
> as are the strings of length L+1, and those of length
> L+2?
it doesn't, but it says that if there is no END to the lengths of strings, then

they are potentially infinite. They can go on forever, just like the set. But
it is only when they DO go on forever that the set can as well.
>
> If the process of adding one more character:
> − gives me another set of words with finite length
> and
> − doesn't end,
>
> then you have just said that there is no end to the
> list of finite−length words. I don't care if you think
> "eventually" I'll get to infinite words. You just stated
> that the list of FINITE words doesn't end.
Not in any finite number of steps. In any case, the sum of a finite number of
sets of strings of finite lengths is a finite sum.
>
> > If there is any finite upper
> > bound on the length of strings in the language,
>
> There is none. But any given string is not a list, it's
> just a string. It has a fixed length. And there are longer
> strings in the language.
>
> > then there is a finite upper
> > bound on the number of strings in the language.
>
> There is none.
Why do you insist the strings with no upper bound are finite and the set with
no upper bound is infinite?
>
> > > > Otherwise,
> > > > what do you mean by all strings being finite?
> > >
> > > That any particular string comes to an end.
> > At what point?
>
> At some finite number L. But that doesn't preclude the
> existence of length L+1 strings.
>
> > If every string has a finite end,
>
> It does.
>
> > meaning that length<K for some
> > finite K,
>
> No, that is not the meaning of "every string is finite".
For that string, yes it does. I didn;'t say every string.
>
> Oh, wait, I see what you mean.
>
> Let me correct your statement do be more precise.

>
> "String X is finite means that there exists finite
> K(X) such that the length of X < K(X)".
>
> That is true.
>
> Of course, then if I have string Y, the statement is
> that length(Y) < K(Y) for some finite K(Y). But there's
> no requirement that there's one K that works for all
> strings.
>
> Every string has a potentially different value of K(X).
But K is always finite, according to you, therefore you cannot have an infinite number of strings.
>
> > then S^K is the maximum size of the language.
>
> No, because the way you defined K it was specific to
> a single string. That carries no implications that all
> strings in the language have length < K. And in fact
> they don't, since for any finite K, there are strings
> of length K+1.
All strings have length <oo, therefore the set has size<oo.
>
> > > That doesn't mean the list of strings come to an end, since
> > > you can always take any finite string and add one more
> > > character, leaving you with a bigger but still finite
> > > string.
> > Exactly, so there is no upper bound on the lengths of strings,
>
> Strings, plural. But of course each string is fixed and
> finite in length.
>
> > and they can be
> > infinite.
>
> Incorrect.
Why? Why can't you have infinitely long strings, such as the decimal expansion of 1/3?
>
> > They never stop getting longer, do they?
>
> No individual string "gets longer". But there is always a
> different, finite string which is larger.
One could say the same for a set of strings. But, you can add elements to sets. Well, you can add characters to strings, so your claim that strings are somehow more static than sets is bunk.
>
> > What makes them have to be finite?
>
> The fact that when you add one character to a finite string,

> you still have a finite string, combined with the fact
> that there is no end to the process of adding one character.
And when you add a finite number of strings to a finite set, as we are doing,
you still have a finite set, right? And there is no end to the process of
adding finite sets to the finite set. Same difference, except somehow you think
in this case the set is infinite. How can the set be infinite, when adding a
finite number of elements to a finite number of elements always yields a finite
number of elements?
>
> THERE IS NO END TO THE PROCESS OF CREATING LARGER FINITE
> STRINGS. That's what makes the strings in this unending
> finite−string creator "have to be finite".
They are finite because they have no end? You better check that thought.
>
> Even though you think "eventually" it gets to be infinite,
> I think you believe that the process of growing finite
> strings one−by−one never gets to an end, never gets to
> a largest finite, and never becomes infinite.
Not until the strings themselves become infinitely long.
>
> Since you believe there is no largest finite, why do
> you turn around and say "being finite means there must
> be a largest value K"?
I never said there is a largest finite.
>
> There is no largest finite.
>
> There is no longest finite string.
There is no largest finite set.
>
> There is no K such that length(finite string)<K for all
> finite strings. If there were, K would be the largest
> finite. And you don't think there is a largest finite.
No, but you seem to be back to your initial misunderstanding of my statement,
whcih you seemed to have caught, but now dropped again.
>
> Feh, enough. You're running in circles and so am I in
> responding.
It feels like that to me too. Just explain why your logic treats the strings in
the language differently than the characaters in the strings, and how S^L is
infinite with finite S and L, or how sum(x=1−>k:S^x) is infinite for finite S
and k. It is a mystery to me that you all can't get this.
> − Randy
>
>

−−
Smiles,

Tony
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- ***Follow−Ups***:
    - ***Re: infinity***
        - *From:* Virgil

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