Re: Calculus XOR Probability

Source: http://sci.tech−archive.net/Archive/sci.math/2006−04/msg04669.html

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- *From*: Tony Orlow <aeo6@xxxxxxxxxxx>

- *Date*: Tue, 25 Apr 2006 12:30:56 −0400

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imaginatorium@xxxxxxxxxxxxx said:

> Tony Orlow wrote:
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> > imaginatorium@xxxxxxxxxxxxx said:
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> > > Tony Orlow wrote:
> > >
> > > > David R Tribble said:
> > > >
> > > > > Tony Orlow wrote: [on NaN]
> > > > >
> > > > > > So, it's just a placeholder for where you might have a number, but you don't have a number, so it's NaN. Real great. What kind of math can you do on a Java NaN?
> > > > >
> > > > > Pretty much the same arithmetic operations you can do on Math.INFINITY in Java. An arithmetic operation involving a NaN results in a NaN, and similarly any operation

involving an infinity
operand results in either
an infinity or a NaN.

But you're not using Java
floating−point arithmetic as
a basis to
explain abstract
mathematics, are you?

Why don't you ask Brian why he compared
infinite set sizes to NaNs in Java?

Sorry, I probably just introduced extra confusion − not
something
you're exactly short on, Tony.

You described counting the size of a finite set. OK. No
problem.
You suggested that *in the sense of counting a finite set*, an
infinite
set does not have such a "size". Also OK − no problem.

In handling numerical calculations in Javascript and other
such
languages, it is possible to give a variable any of a (very)
large
number of numerical values, and also the non−numerical
value
represented by the atomic symbol "NaN". In just the same
way one could
identify the size of any finite set as the numerical value
obtained
from a counting process, and for any set that is not a finite
set, use
a "placeholder" (if you like) value which is not a size
(number), but
is an atomic symbol (e.g.) 'NaS' for not−a−size.

I wondered if this might help, but it doesn't look like it.

Well, that sounds almost like what the standard theory does, doesn't it? And, what I've been advocating is a more numeric approach to infinity. I see infinity as a quantitative concept, and seek to treat it more consistently with the rest of math, and not as some kind of magical exception to every rule. So, thanks for the suggestion, but it's not very satisfying, because NaS seems like Not an Answer, and answers are there to be found.

> OK, can you then explain your comment in the post just up this thread
> (here's a googlink):
> http://groups.google.com/group/sci.math/browse_frm/thread/c5e8522696fb2b97?scoring=d

No, I really can't. I see two posts of mine on that first page, and have no idea which part of which you want me to comment on. Any clues?

> Tony Orlow wrote:
>
>> imaginator...@xxxxxxxxxxxxx said:
>>
>>> Tony Orlow wrote:
>
> <snip>
>
>>>> Because that's what a number IS. You have a
>>>> set of objects, and you ask what
>>>> the size is. How do you measure this? For
>>>> finite sets, you COUNT the objects,
>>>> and the answer is a NUMBER.
>>>
>>> Right. Which 'NUMBER' in particular? I suggest the one at
>>> which the
>>> count stops (because it has reached the end of the finite set).
>>> In the
>>> familiar method of counting by reciting a ditty, this answer is
>>> thus
>>> the last number shouted out.
>>
>> Right, so generally if there is no well defined end, there is no well defined size.
>
> Sometimes you seem to agree that (for example) the sequence of pofnats
> (0, 1, 2, ...) has no end, and almost always you agree it has no
> well−defined end. You say this means it "has no well defined size", yet
> you (now) say you advocate "a more numeric approach to infinity", which
> appears to mean you insist it must have a "size". It doesn't bother you
> that these two claims appear to contradict each other?

It doesn't bother me that they appear to YOU to contradict each other. I have repeatedly said that the unboundedness of the finites poses problems for measuring the set of finite naturals, and that no real size can be attributed to this set. However, if we say that there is a specific infinite number of reals in each unit interval, and that there is an equally infinite number of unit intervals on the real line, then we have a cohesive system consistent with rules governing finite sets of such values, namely, the Inverse Function Rule.

Just a note to Virgil: You complained that my IFR will only work with monotonically increasing functions. That covers most quantitative bijections, unless they use trigonometric functions or some other way to rearrange the target set out of quantitative order. More work needs to be done to directly address such situations, but every bijection is an invertible function, and so this is not something entirely new, but an extension to the notion of a bijection as a tool for measuring infinite sets.

Brian Chandler
http://imaginatorium.org

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Smiles,

Tony
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