

# Re: Calculus XOR Probability

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*Source:* <http://sci.tech-archive.net/Archive/sci.math/2006-04/msg04466.html>

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- *From:* Tony Orlow <[aeo6@xxxxxxxxxxxx](mailto:aeo6@xxxxxxxxxxxx)>
  - *Date:* Mon, 24 Apr 2006 12:37:57 -0400
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imaginorium@xxxxxxxxxxxx said:

Tony Orlow wrote:

imaginorium@xxxxxxxxxxxx said:

Tony Orlow wrote:

Matt Gutting said:

Tony Orlow wrote:

Matt  
Gutting  
said:

Tony  
Orlow  
wrote:

Matt  
Gutting  
said:

Tony  
Orlow  
wrote:

<snip>

Basically,  
all  
I'm  
saying  
boils  
down  
to

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inductive  
proof  
of  
equality  
holding  
for  
infinite  
n.  
If  
some  
relationship  
between  
measures  
of  
a  
set  
holds  
for  
all  
finite  
cases  
greater  
than  
some  
n,  
then  
it  
can  
be  
considered  
to  
hold  
for  
infinite  
n,

(Matt)

How  
do  
you  
know  
that  
there  
are  
any  
infinite  
n  
in  
the  
first

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place?

(Tony  
again)

Because  
there  
are  
sets  
with  
infinite  
numbers  
of  
elements,  
such  
as  
any  
set  
of  
all  
reals  
in  
a  
finite  
interval.  
You  
cannot  
have  
half  
a  
real  
number  
in  
your  
set,  
so  
this  
infinite  
number  
is  
integral,  
and  
therefore  
part  
of  
what  
I  
consider  
the  
integers,  
or

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hyperintegers.  
Otherwise,  
infinite  
sets  
cannot  
have  
a  
size,  
which  
makes  
the  
"infinite"  
part  
kind  
of  
meaningless.

But  
how  
do  
you  
know  
it's  
an  
integer  
in  
the  
first  
place?  
In  
other  
words,  
what  
makes  
you  
so  
sure  
that  
there  
is  
an  
integer  
describing  
the  
size  
of  
this  
set?  
Must  
sizes  
always

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be  
describable  
by  
a  
number?  
If  
so,  
why?

Matt

Because the size of the set is the count of the elements included in it, as far as I'm concerned. That's why I don't accept a system where you add an infinite number of elements and the "size" doesn't change. You don't normally have fractional elements in a set, so this "count" has got to be integral, whether it's finite or infinite. Of course, if you are using something like fuzzy set

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theory, you  
may very  
well have  
set sizes  
which are  
not integral,  
but I don't  
think that's  
what we're  
discussing,  
is it?

I'm not talking about  
fractional set sizes. I'm  
asking how you know that  
the  
descriptor which describes  
the size of this set is a  
number.

Matt

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.

Fine. I think that's an excellent start. I'd prefer to say that there  
is no end at all, though a fortiori there is no well-defined end. I'm  
not too happy with the idea that it can ever be productive to discuss a  
somehow ill-defined something that obviously does not in fact exist.

So let's agree to eschew assigning a "size" to any set for which any

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counting is unending. I'm sure you're familiar with the general notion in software that if you have a property – say a database field called "size" – that is not always available, it helps to have two sorts of values in that field: one is just a number, that is the size; the other is a flag (string, atom, whatever, in the language you're using), such as "Nosize", meaning that no size is assigned. If you're familiar with javascript, variables can have numeric values, but they can also have the value 'NaN', for 'not a number', which means that they are `_not_` a number. However, the set of values that a javascript variable may have is a very well-defined (finite!) one, and it is perfectly possible to discuss the mathematical structure of the values including NaN under arithmetical operators. It is also convenient to invent a name for the union of the set of numeric values (numbers) with the not-number values NaN and also the javascript specific value called "Infinity" (which need not be related to the general i-word); we might call them numeroids, remembering that at least some are definitely not numbers.

Do you follow this? If so can you not see that several of your following remarks are, to put it politely, missing the point? Mathematics is not about "numbers", it is about abstract structures far more general than "numbers".

Doesn't it occur to you that, no matter what kind of field you're using, it all boils down to 0's and 1's in the end, and that NaN is simply a numeric value reserved for such purposes? Do the abstract structures of which you speak go beyond numbers, or are they encoded as numbers?

So, for infinite sets, you want to claim that  
size  
is something OTHER than a number???

Well, the "size" of an unending sequence can't really be the  
last  
number you shout (oh, or was it 'sing') from the ditty, can it,  
since  
there isn't a last number.

Is that true of all infinite sets? Isn't "1" the last number chanted in the  
ditty of reals in  $[0,1]$ ?

Do remind me how this ditty starts? I mean, I assume "0, ..." but what  
follows 0?

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(sigh) 0.000...000, 0.000...001, 0.000...010, ... , 0.111...110, 0.111...111,  
1.000...000. That's the series ( $x=0 \rightarrow \text{Big'un: Lil'un}^*x$ ).

Of course that's not the size, but if you count by  
Lil'uns, the last Lil'un is the Big'unth one, and Big'un's the last index  
dittied.

And can you define this ditty in the way I suggested a while back?

A while back? You mean right above?

[Pause while you gibber for a bit]

[Pause with you ditty and doodle your way into the haze...]

[Well, I assumed you'd have to chant that mantra bit]

I didn't see a "largest finite" argument. I don't just go around saying "Huyah  
huyah" for my health you know (although it helps ;).

Pray tell, what kind of a thing IS the size  
of an infinite set, if not some kind of infinite  
number? If it's not a number,  
what is it doing in mathematics? This just  
seems like a silly question.

See above.

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?

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Yes, it probably does to you, but then you have not the tiniest clue what mathematics is nor what it is about. Do you think the elements of the Klein 4–group are "numbers"?

I am not familiar with the Klein 4–group, but if truth itself is decomposable into numbers, then what isn't? Of course, something like the size of a set is generally considered to mean the number of elements in the set, so Klein or not, set sizes are numbers. I'm not even interested in debating this. It's a matter of mathematical fundamentalism.

The fact you don't know (even vaguely) what the Klein 4–group is is diagnostic, I think. You have plainly never read any general introductory texts to mathematics. (Goodness knows what "truth being decomposable into numbers" means – sounds like something you caught off Lester.)

No, it's something I tried to explain to Lester, but of course it met resistance. He seems to want to explore the nature of logical truth, but not in any logical way, as far as I can tell. I explained it in another post last week.

And I wonder what you mean by "mathematical fundamentalism"? I don't think you have any idea how flexible mathematicians can be (have to be) – the only real requirement is that something makes sense (hint: your stuff doesn't), and within that limit, almost anything can be defined however you like. So you have been told many times already, but the basic problem is that you simply have no idea how much you are missing in terms of a basic grasp of this subject you believe you are about to revolutionise.

Well, that was a really great explanation of a Klein 4–group. Thanks for your assistance. I can see that you have only the furtherment of knowledge as a life goal. Keep up the good work.

Brian Chandler  
<http://iminatorium.org>

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Smiles,

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Tony

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