No Unique Initial Segment And No Characteristic Expansion.

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Infinite people each flip coins infinite times.
Can you always find a different sequence of heads and tails?

sci.math and sci.logic went quiet on this question for about a week, then against all logic, probability theory, and common sense they all agreed YES. Believers of hyperinfinities have no shame!

How on Earth can you exhaust an infinite set? This is their solution, a standard application of Cantor's diagonalisation technique, the hailed method of proving infinity incomplete (infinite already means never ending or incomplete!)

Take one of the people, whatever his 1st flip was, reverse it! If he flipped a head you select tail, if he flipped a tail, heads. That's your first outcome, cross him off and select someone else, whatever was their second flip, reverse it! Keep on going and you have an infinite sequence that is different to everyone's sequence in atleast one flip.

THAT'S THE PROOF! That's hyperinfinity and cardinality theory 101.

How many assumptions about infinity are they taking for granted here?

What jumps straight out at most everyone is :
Aren't all possible combinations of heads and tails for infinite flips already been done?

This doesn't stir the Cantor supporter one bit. They think if the combination is on the list, it must be at some natural number position n, but the nth flip of person n is necessarily different! Voila a (somewhat contrived) contradiction. Hence the sequence does not appear anywhere on the list.

Makes me reminiss to lectures on these types of problems. You decide for yourself "no this is right". So the lecturer asks you for the further outcome of that conclusion, which goes around in a circle and proves what he wanted to. It's played out to everyone who studies

theory, you can see the conversions taking place on sci.logic and sci.math each week.

The other supporting argument Cantor followers have is demonstrated when you assume this infinite list:

0.222222..
0.322222..
0.332222..
0.333222..
0.333322..
0.333332..
..

The diagonal is 0.22222..

If we modify every digit, we can get
0.33333..

Does 0.3.. occur on the list?

0.3333333
<−−L−−>

There are unlimited 3s in sequence on the list! Although 0.333.. has No Unique Initial Segment, it does have a Characteristic Expansion. It ends in 333.., all members end in 222.. so no, 0.3.. does not occur on the list.

Back to the infinite flippers list:

httttt..
hhhttt..
hhhhhh..
tttttt..
hhhttt..
..

With probability 1, this list contains every initial segment possible of heads and tails sequences. Assume there is some initial segment that is not on the list. TTTHHH This sequence has a finite length L, there are 2^L possible sequences of length L, so with infinite amount of flippers that initial segment will be covered with probability 1.

The diagonal sequence HHHTT.. inverted TTTHH.. has No Unique Initial Segment. That in itself does not prove it's on the list, remember 0.333..! But TTTHH.. has No Characteristic Expansion either. As far as can be determined the sequence appears on the list.

So although we may not be able to disprove the hyperinfinity status of the diagonal yet, we can show that it is a N.U.I.S.A.N.C.E.

Herc