Cantor's complete list assumption is not extrapolated

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From: HERC777 (*herc777_at_hotmail.com*)
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I'll borrow the word permutation to mean unique sequence.

1 Assume a real number list
2 Form a new permutation different to every number on the list
3 The list is incomplete

1 Assume a COMPLETE real number list containing every permutation
2 Form a new permutation different to every number on the list
3 CONTRADICTION − the list is already complete

The assumption 1, is that every infinitely long permutation is listed.
The anti−diag number is literally constructed as
"form a new permutation different to every number on the list".

With a finite list anti−diag always forms a new number and
is a valid technique, its easy to imagine an infinite anti−diag
but is it valid? It forms a contradiction so either 1 or 2 is wrong.

Given every infinite permutation is present on the list, the
construction of a new permutation is itself flawed.

A binary example.

Small samples of radioactive material have their particle emission
rate measured. A sample frame rate is established and the output
of a digitised poisson distribution is recorded, 0 for no emission,
1 for a particle emmitted − a ping on the gieger counter.

sample 1 01010100100101001010101101110101010..
sample 2 01010101101010101010101010101010..
sample 3 11101101011101010111010110101011101010..

Each sample runs forever, there is unlimited sampling and
resources for the experiment. After about 10 samples, all
possible permutations for the 1st 3 frames are recorded.

000
001
010
011
100
101
110
111

8 possibilities, with some doubling up of results.

After several million samples, the variations in the first 15 frames are all covered.

000000000000000101010101010...
000000000000001101010101010...
000000000000010101010101010...
000000000000011101010101010...
..
111111111111111101010101010...

This process is logarithmic, it takes much longer for the covered permutations to grow as the list grows. What is the behaviour as the list approaches infinity?

log(oo) = 00

Do all permutations eventually occur? This is the expected physical and probabilistic result. Using infinite diagonalisation this theoretically does not happen, even with infinite resources.

There are infinite samples, all *known* permutations are covered yet anti−diag results in a new permutation??

According to accepted mathematics today, the log(oo) length of the covered permutations reaches an end, and the tail end of the numbers are again random and unique.

This is what hyperinfinity is based on, the privale