

# Re: A simple undiagonalisable list – ILLUSTRATED

---

*Source:* <http://sci.tech–archive.net/Archive/sci.logic/2005–05/msg00165.html>

---

- *From:* "george" <[greeneg@xxxxxxxxxx](mailto:greeneg@xxxxxxxxxx)>
  - *Date:* 14 May 2005 11:58:37 –0700
- 

HERC777 wrote:

- > what other classes of sets have the property
- > that only given the
- > diagonal you can rearrange the digits
- > of the diagonal in order to form
- > an antidiagonal?

This is NOT a property of "classes of sets", DUMBASS.  
This is a property of REAL NUMBERS (with place–value expansions, anyway). An "anti" of some real number (or of its expansion rather) is just ANY old OTHER real number that differs from the original real at EVERY spot. If  $d_N$  is the  $N$ th digit of real  $d$ , then  $a_N = 9 - d_N$  defines a new real  $a$  that is "anti"  $d$ . If  $d$  was originally the diagonal of something then  $a$  is, therefore, an anti–diagonal of that same something. Please note that once you get to bases bigger than 2, EVERY list of (place–value expansions of) reals has a HELL Of a lot MORE anti–diagonals than it has members.

Swapping elements on the list just leads to swapping digits of the diagonal WITH EACH OTHER. Your question therefore just boils down to "when can you rearrange the digits of the decimal expansion of a real in such a way as to ensure that no position has the same digit it started with?"  
And the answer is, "whenever, among the digits occurring in infinitely many positions of the real, there is one with the property that the number of places at which it FAILS to occur is also infinite". If, in violation of this, you had a string with 0 0's, 1 1, 2 2's, 3 3's, 4 4's, 5 5's, 6 6's, 7 7's, 8 8's, and infinitely many 9's, then, obviously, there would be no rearrangement that could ensure that the infinitely many 9's all became something else.  
But if you had all the even positions 9's and all the odd ones something else, then, obviously, you could just swap every position with the adjacent one.

- Prev by Date: [\*Re: A Simple Non-Diagonalisable List\*](#)
- Next by Date: [\*Re: Question on Chaitin\*](#)
- Previous by thread: [\*Re: A simple undiagonalisable list – ILLUSTRATED\*](#)
- Index(es):
  - ◆ [\*Date\*](#)
  - ◆ [\*Thread\*](#)