

sci.crypt: Re: [XPOST] A unique number for every "person" – can it be done?

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In article <GrrUd.286\$3.19856@news7.onvoy.net>, gerard46 <gerard46@rrt.net> wrote:

>I once read somewhere that as of the dawn of our history (starting from  
>40,000 years ago), that there were "only" a few millions of people who  
>had lived (and that includes baby-deaths, as I recall). There was a  
>graph showing the total living population of the earth, as well as the  
>total of people who had lived, up to any point (year).

>

>If anyone knows of a website that shows this graph or a version of it,  
>it would be nice to view again. There weren't that many (dead) people  
>on earth. Of course, "many" is a subjective term, but not beyond  
>grasping (understanding).

It is a consequence of exponential growth of population that the total number who have ever lived will always be a fixed multiple of the then-current population.

But certainly there is an upper bound to the number of humans who can exist at once as long as human beings are disjoint subsets of the universe's elementary particles. What does the universe consist of, maybe 50 or more orders of magnitude more matter than a human being? Then you could only have at most  $10^{50}$  humans at a time.

And how long will the universe last? It's already maybe  $10^{10}$  years old, and although there are different proposed models for how it will end, they all project an ending in less than  $10^{11}$  more years. Even if the human lifespan is somehow reduced to mere seconds, that only allows for a re-constituting of the matter of the universe into new humans at most  $10^7$  times per year, so that there cannot be more than  $10^{18}$  generations of humans.

Combining these guesstimates puts an upper bound well short of  $10^{68}$  for the number of humans there will ever be, and the hypotheses necessary to get anywhere close to that are frankly ridiculous. If every person were assigned a 100-digit number there would never, ever be need to

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have duplicate numbers.

Things are more interesting when numbers are also to be assigned to groups of individuals. The power-set of the set of humans already has cardinality larger than  $2^{(6 \text{ billion})}$ , and the kind of reasoning above allows for say  $2^{(10^{20})}$  or  $2^$