Life's big questions

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Mathematics is a tool for analyzing situations and providing information that we can reliably act upon. Sometimes we can get a definite answer, but other times, when things are complicated, we have to make some assumptions and then we have to settle for a rougher idea of the state of the world.

To illustrate when we can get precise answers, let us start with the recent birth of the royal baby. Do you think that this baby is more or less that a million seconds old? Since there are 60 seconds in a minutes, 60 minutes in an hour and 24 hours in a day, this is an something we can answer preceisely. We can find the actual date on which he was a million seconds old. Let us ask a more personal question: are *you* a billion seconds old? (A billion is a thousand million or 10^9.) What is your instinct about the size of this number? Are you surprised at the answer? How long do you expect (hope) to live in seconds?

For an example of a situation where an exact answer is not possible, we begin by noting that the present population of the globe is at least seven billion. Just a few centuries ago, the global population could be numbered in the hundreds of thousands, less by a factor of several thousand. This surely means that a goodly fraction of all the human beings that ever lived are alive now. So let us ask, what is the actual percentage?

If we are to have a stab at this question, we have to amass as much information as we can about the population of the world in the past and the length of a generation for example. In the absence of hard information, we may have to make a few assumptions. Different people who look at this question will make different assumptions and have recourse to different information, so we will have to be careful to check these for plausibility. I would be interested in readers having a go at this question and letting me know what they come up with.

Another question in a similar vein arises from the observation that we each have two parents, four grandparents, and so on, with the number of our parentage doubling with each generation in the past. As we go further back, this gives us a lot of ancestors and at some point this number will exceed the population of the earth. This means that there must in the past be some overlapping, some primeval parent whose line of descent to us comes through at least two separate routes. How many generations do we have to go back to be sure that this is the case?