Re: some interview questions

Source: http://sci.tech−archive.net/Archive/sci.math/2006−09/msg02232.html

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- *Date*: Tue, 12 Sep 2006 13:36:10 +0200

William Hughes a écrit :

> David R Tribble wrote:
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> > How come no one has attempted an answer to (2)?
>
> Because it is rather harder :)
>
> Recall the question is;
>
> 2. Suppose you have a function that returns random 64−bit integers
> without checking if a particular integer has already been used. How
> many integers would be returned before the probability that an
> integer
> has been repeated is above 0.5?
>
> This is, of course, the birthday problem. But with the very large
> 2^64,
> computation of the exact answer is not practical,

so an approximation

> is
> needed.
>
> A very rough approximation can be made by saying that if I choose N
> numbers
> I get N(N−1)/2 pairs. Since each pair has a 1/2^64 chance of matching,
> I need about 2^63 pairs to get a probability of 1/2 (I did say very
> rough),
> so I need N(N−1) = 2^64, so N is about 2^32.
> More careful analysis shows that this is only off by about 20%.

> However, even the rough solution indicates
> the important fact that given X uniformly distributed outcomes,
> one needs about sqrt(x) tries to get a repeat, and the interviewer.
> would probably be satisifed.

In fact, you are looking for n such that P= prod (N−k)/N (k=0..n−1) =0.5, with N=2^64. P=N^−n N!/(N−n)!, and Stirling formula will give a very good approximation of that

> −William Hughes

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