

Re: Is unsorted DB searching in NP?

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d. lee wrote:

> *Problem:*

> An array $A[i], i=1..N, (N=2^n)$

> contains $N-1$ '0' and only one '1' in unsorted manner.

> Find i where $A[i]=1$.

>

> *Question:*

> 1. Is this problem in NP?

– what is your input data? the array A? its size N? or just the integer n (the log of N)? I guess it is A and N. n is just a secondary thing.

could ask whether it is in NP. the closest rewording I can figure is

"Given A and i, is $A[i] = 1$?"

or possibly

"Given A and k, is there an $i < k$ such that $A[i] = 1$?"

To tell what complexity class this is in, it'd still be nicer to translate a little more (make a graph problem out of it).

I highly suspect it is way down the complexity hierarchy (say in L (logspace complete)) but I have no reduction in mind.

> 2. Is this EXP (which is not P) ?

– EXP is a complexity class of –decision– problems. same difficulty as #1.

– if I guess your real question is "Is this an exponential algorithm?", then no, because I can give a linear time algorithm (an algorithm that takes time proportional to the input size N): scan the array in order, return i, when you

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find $A[i] = 1$.

> 3. according to 1 & 2

> can we say $NP \neq P$?

No.

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(remove q to reply)