

Re: interview question on primes

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- *From:* Gerry Myerson <gerry@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>
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In article

<31215dba-42e7-476e-9771-27f9b746dee8@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>, Digital Puer <digital_puer@xxxxxxxxxx> wrote:

Well, I passed the interview, so I think the interviewer at least thought my solution was reasonable. However, the reason I'm asking sci.math this question (as opposed to one of the programming newsgroups) is to get some insight from mathematicians. Given my exhaustive search solution, what's a better solution that could be presented in 5-10 minutes? I am not a number theorist.

On Feb 25, 5:28 pm, "Peter Webb"

<webbfam...@xxxxxxxxxxxxxxxxxxxxxxxxxxxx> wrote:

If $A=7$ and $B=1,000,000$ a sieve would be far more efficient.

Are you referring to the Sieve of Eratosthenes algorithm?
That needs to start at 1, right?

I'm not certain what Peter Webb had in mind,
but let me change the problem a little and give a possible answer.

Suppose you have to find all the primes between
500,000 and 1,000,000.

First use the Sieve of Eratosthenes to find all the primes
up to 1,000 (because 1,000 is the square root of 1,000,000).

Then sieve the numbers from 500,000 to 1,000,000 by those primes.
That is, delete all the multiples of 2, then of 3, of 5, etc. All the
numbers that are still there after you've sieved by the primes up to
1,000 are primes.

Re: interview question on primes

If $A =$ some 50 digit number and $B = A + 100$, you would probably use a pseudo-prime checking function with brute force used only for checking possible pseudoprimes.

Can you give me a URL for further information on this approach?

<http://primes.utm.edu/> might be a good place to start.

If "brute force" means "trial division up to the square root" then I don't think it's any good even to check a single 50-digit number.

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Gerry Myerson (gerry@xxxxxxxxxxxxxxxx) (i -> u for email)

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