

On Beating Large Prime Records

Jeff Kinne, Geoff Exoo

Indiana State University

Indiana Academy of Sciences, March 15, 2014

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History: ancient Greeks, ... Renaissance mathematicians, ...

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Note: $\frac{1}{\ln(100)} = 0.21\dots$

x = 221

Is this 100 digit number prime? – use trial division

- If even, done \Rightarrow not prime
- If multiple of 3, done \Rightarrow not prime
- If multiple of 5, done \Rightarrow not prime
- ...
- Check multiples up to ... **sqrt of the number**
- If no divisors found, number is prime

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 - $x = 6$. $a = 2$. $a^{x-1} = 2^5 = 32$. $32 \bmod 6 = 2$.
6 is not prime.
 - **Running time: pretty fast**, see google/wikipedia

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- Repeat until all tests passed

Thank You, The End

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Links

- kinnejeff.com/talks.html – these slides, and a more detailed talk about this research
- [Prime Pages, by Chris Caldwell](#) – THE source of information on prime records, and the official prime records database
- Software/libraries we use: [GMP](#), [OpenPFGW](#)

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