

The 2013 Presidential Medallion Programming Challenge



The object of the challenge is to write an original program that is able to find the first one billion prime numbers in less than one minute. All programs will be tested on the CS server (cs.indstate.edu) subject to the following conditions.

- The program must accept a command line argument, a positive integer, n , less than one billion, and print the n -th prime along with the billionth prime. Note: the purpose of the argument is to help insure that the program actually generates all one billion primes, not just the billionth.
- The program may not use any data files.
- Any initialized data structures must contain fewer than 50 elements.
- When the program is compiled, no special libraries may be linked. For example, you cannot use `gmp` (though it is unlikely `gmp` would be of any real help).
- Timing will be done on the CS server.
- All decisions related to the interpretation of the above rules will be made by the sponsor.
- This offer expires at end of February, 2013, EST.

The following information may be of interest. The one billionth prime is

22 801 763 489

which can be easily represented as a 64-bit integer, but not as a 32-bit integer. Also note that 22 billion bits is nearly three gigabytes, and half that many bits is still more one gigabyte.

If your program completes this task using less than one minute of CPU (user time), you will be awarded a genuine limited edition cupro-nickel medallion minted by the U.S. government, and depicting the first President of these United States, George Washington. The medallion weighs in excess of 5.5 grams.

Should your program fail to qualify for the top award, but still finish in less than three minutes, a somewhat smaller copper-zinc medallion showing a portrait of Abraham Lincoln will be offered as a consolation prize.