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good hash table primes

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In the course of designing a good [hashing configuration](#), it is helpful to have a list of [prime numbers](#) for the [hash table](#) size.

The following is such a list. It has the [properties](#) that:

1. each [number](#) in the list is prime
2. each number is slightly less than twice the size of the previous
3. each number is as far as possible from the nearest two [powers of two](#)

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Using primes for hash tables is a good idea because it minimizes clustering in the hashed table. Item (2) is nice because it is convenient for growing a hash table in the [face](#) of expanding data. Item (3) has, allegedly, been shown to yield especially good results in practice.

And here is the list:

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lwr	upr	% err	prime
2 ⁵	2 ⁶	10.416667	53
2 ⁶	2 ⁷	1.041667	97
2 ⁷	2 ⁸	0.520833	193
2 ⁸	2 ⁹	1.302083	389
2 ⁹	2 ¹⁰	0.130208	769
2 ¹⁰	2 ¹¹	0.455729	1543
2 ¹¹	2 ¹²	0.227865	3079
2 ¹²	2 ¹³	0.113932	6151
2 ¹³	2 ¹⁴	0.008138	12289
2 ¹⁴	2 ¹⁵	0.069173	24593
2 ¹⁵	2 ¹⁶	0.010173	49157
2 ¹⁶	2 ¹⁷	0.013224	98317
2 ¹⁷	2 ¹⁸	0.002543	196613
2 ¹⁸	2 ¹⁹	0.006358	393241
2 ¹⁹	2 ²⁰	0.000127	786433
2 ²⁰	2 ²¹	0.000318	1572869
2 ²¹	2 ²²	0.000350	3145739
2 ²²	2 ²³	0.000207	6291469
2 ²³	2 ²⁴	0.000040	12582917
2 ²⁴	2 ²⁵	0.000075	25165843
2 ²⁵	2 ²⁶	0.000010	50331653

2^{26}	2^{27}	0.000023	100663319
2^{27}	2^{28}	0.000009	201326611
2^{28}	2^{29}	0.000001	402653189
2^{29}	2^{30}	0.000011	805306457
2^{30}	2^{31}	0.000000	1610612741

The [columns](#) are, in [order](#), the lower bounding power of two, the upper bounding power of two, the relative deviation (in [percent](#)) of the prime number from the optimal middle of the first two, and finally the prime itself.

Happy hashing!

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There is [1 reference](#) to this entry.

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[AMS MSC: 68P20](#) (Computer science :: Theory of data :: Information storage and retrieval)
[68P10](#) (Computer science :: Theory of data :: Searching and sorting)
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