

A method based on concatenation to create very large numbers with very few prime factors

Abstract. In this paper I share a very interesting discovery made more or less by accident: taking a number having just even digits, like for instance 224866802226608 (I have chosen this randomly right now when I am writing the Abstract) and concatenating it three times with itself and then to the right with the digit 1 (like in the example taken 2248668022266082248668022266082248668022266081) seems that are great chances to obtain a number with very few prime factors (in the case taken just 4 prime factors).

Observation:

Taking a number having just even digits and concatenating it three times with itself and then to the right with the digit 1 seems that are great chances to obtain a number with very few prime factors.

Examples:

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:   for           888866824           the           number
8888668248888668248888668241 has 3 prime factors;
:   for           2244660800          the           number
2244660800224466080022446608001 has 2 prime factors;
:   for           66624848824          the           number
6662484882466624848824666248488241 has 3 prime
factors;
:   for           668482848284          the           number
6684828482846684828482846684828482841 has 3 prime
factors;
:   for           8000024646480          the           number
8000024646480800002464648080000246464801 has 3 prime
factors;
:   for           22266644488044          the           number
2226664448804422266644488044222666444880441 has 4
prime factors;
:   for           880008884484828          the           number
8800088844848288800088844848288800088844848281 has 3
prime factors;
:   for           444666444000804          the           number
4446664440008044446664440008044446664440008041 has 4
prime factors;
:   for           888866640404202          the           number
8888666404042028888666404042028888666404042021 has 2
prime factors;
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:   for           888000444000404           the           number
8880004440004048880004440004048880004440004041 has 3
prime factors;
:   for           666888000444606           the           number
6668880004446066668880004446066668880004446061 has 4
prime factors;
:   for           222222222222222           the           number
22222222222222222222222222222222222222222221 has 3
prime factors;
:   for           4444444444444444           the           number
44444444444444444444444444444444444444444441 has 3
prime factors;
:   for           666666666666666           the           number
66666666666666666666666666666666666666666661 has 3
prime factors;
:   for           888888888888888           the           number
88888888888888888888888888888888888888888881 has 4
prime factors;
:   for 242424242424242 the number 242424242424242
242424242424242 242424242424242 242424242424241 has 4
prime factors;
:   for 246802468024680 the number 246802468024680
246802468024680 2468024680246801 has 3 prime factors;
:   for           646464646464646           the           number
6464646464646464646464646464646464646464641 is
prime.

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The sequence of primes obtained concatenating the numbers having only even digits three times with themselves and then to the right with the digit 1 (I conjecture that this sequence has an infinity of terms):

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:   2221, 4441, 6661, 2424241, 2828281, 4040401, 4242421,
6262621, 6868681, 8282821, 2002002001, 2242242241,
2422422421, 2482482481, 2602602601, 2622622621,
2642642641, 4044044041, 4424424421, 4824824821,
6226226221, 6266266261, 6486486481, 6646646641,
6666666661, 6846846841, 8448448441, 8648648641,
2004200420041, 2024202420241, 2042204220421 (...)

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The longest chain, met, with consecutive terms of the general sequence of the numbers obtained like mentioned which are primes has 4 terms: 2482482481, 2602602601, 2622622621, 2642642641.