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Continuous fractions method

$n = 7769$

$i = 0 \Rightarrow b_{-1} = 1$

$b_0 = a_0 = \lfloor \sqrt{7769} \rfloor = 88$

$x_0 = \sqrt{7769} - 88 = 0,141931$

$b_0^2 \bmod n = 7744 \overset{\%n}{=} -25$

$i = 1 \Rightarrow a_1 = \left\lfloor \frac{1}{x_0} \right\rfloor = 7$

$b_1 = a_1 b_0 + b_{-1} = 7 \cdot 88 + 1 = 617$

$x_1 = \frac{1}{x_0} - a_1 = 0,04568$

$b_1^2 \,\%\, n = 380689 \,\%\, 7769 = 8$

$i = 2 \Rightarrow a_2 = \left\lfloor \frac{1}{0,04568} \right\rfloor = 21$

$b_2 = a_2 b_1 + b_0 = 13045 \,\%\, 7769 = 5276$

$x_2 = \frac{1}{x_1} - a_2 = 0,891419$

$b_2^2 \,\%\, n = 27836176 \,\%\, 7769 = 7618 \,\%\, 7769 = -151$

and so on for the rest of the numbers

i	a_i	b_i	$b_i^2 \bmod n$
0	88	88	-25
1	7	617	8
2	21	5276	-151
3	1	5893	19
4	8	5806	-55
5	3	4	16
6	10	5846	-115
7	1	5850	55
8	2	2008	-47
9	3	4105	64

Factorization:

$i=0$: $5^2 \cdot (-1)$

$i=1$: 2^3

$i=2$: $151 \cdot (-1)$

$i=3$: 19

$i=4$: $5 \cdot 11 \cdot (-1)$

$i=5$: 2^4

$i=6$: $5 \cdot 23 \cdot (-1)$

$i=7$: $5 \cdot 11$

$i=8$: $47 \cdot (-1)$

$i=9$: 2^6

Associated vectors:

$$v_0 = (1, 0, 2, 0)$$
$$v_4 = (1, 0, 1, 1)$$
$$v_5 = (0, 4, 0, 0)$$
$$v_7 = (0, 0, 1, 1)$$
$$v_9 = (0, 6, 0, 0)$$

$$v_0 + v_4 + v_5 + v_7 + v_9 = 0 \pmod 2$$

Hence:

$$b = b_0 \cdot b_4 \cdot b_5 \cdot b_7 \cdot b_9 = 88 \cdot 5806 \cdot 4 \cdot 5850 \cdot 4105 = 1711 \pmod n$$
$$c = 2^{\frac{10}{2}} \cdot 5^{\frac{4}{2}} \cdot 11 = 8800 \pmod n = 1031$$

$$b \neq c \Rightarrow \left.\begin{array}{l} \gcd(1711 - 1031, 7769) = 17 \\ \gcd(1711 + 1031, 7769) = 457 \end{array}\right\} \Rightarrow n = 17 \cdot 457$$