

Problem 26

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Mixed LCG Equation

$$x_i \leftarrow (x_{i-1} * a + c) \bmod m$$

The period for problem 25 was 65536. To obtain the same period with a mixed LCG, I chose the parameters $m = 65536$, $c = 3$, and $a = 5$. These parameters give the longest possible length period for a mixed LCG, m . The parameters were selected based on the Hull Dobell Theorem which states:

If $m = 2^k \forall k = 3$, then a mixed LCG will have maximal period $m \forall x_0$ iff
 $a \equiv 1 \bmod m$ and c is odd.