A339023 generalized and plotted in different bases

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The sequence A339023 can be generalized to any base $b > 1$: Let $a_b(n)$ be the number obtained by replacing each digit d of n in the base b with the digital root (in base b) of $n \cdot d$.

For example, $a_3(100) = a_3(10201_3) = 20202_3 = 182$, since $1 \cdot 10201_3 = 10201_3$, $0 \cdot 10201_3 = 0$ and $2 \cdot 10201_3 = 21102_3$. The base-3 digital roots of these numbers are 2, 0 and 2. Thus, in 10201_3, all 1:s get replaced by 2:s, all 0:s get replaced by 0:s and all 2:s get replaced by 2:s and hence, $a_3(10201_3) = 20202_3$.

The following pages contain the graphs of a_b for $b \in \{2, 3, ..., 20\}$. The scales of the plots are written in base 10.

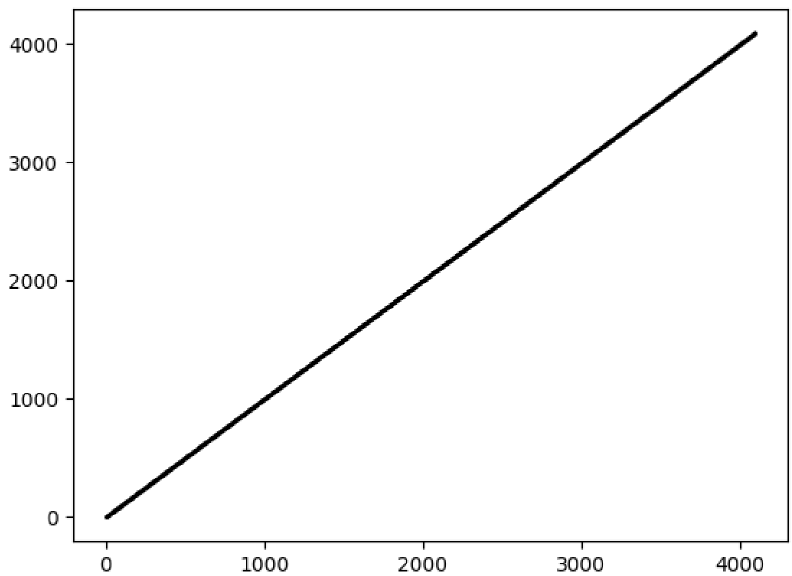

Figure 1: $a_2(n)$ for $n \in \{0, 1, ..., 2^{12}\}$.

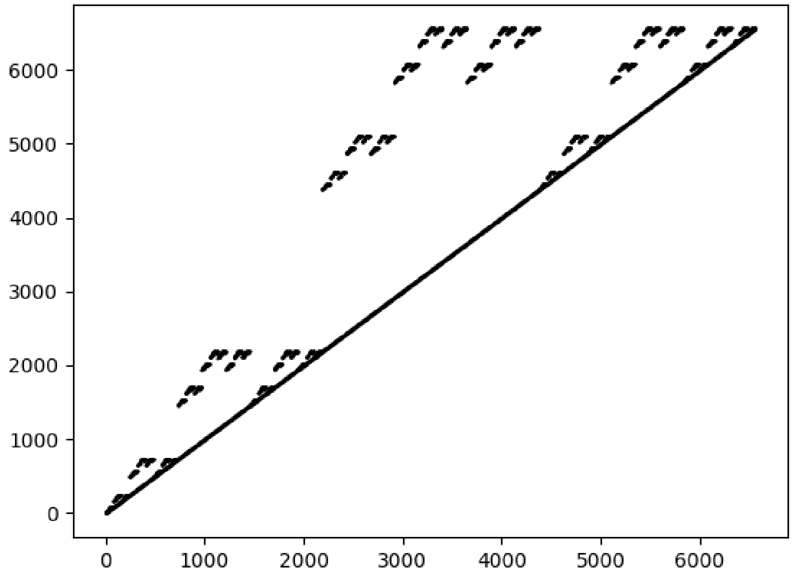

Figure 2: $a_3(n)$ for $n \in \{0, 1, ..., 3^8\}$.

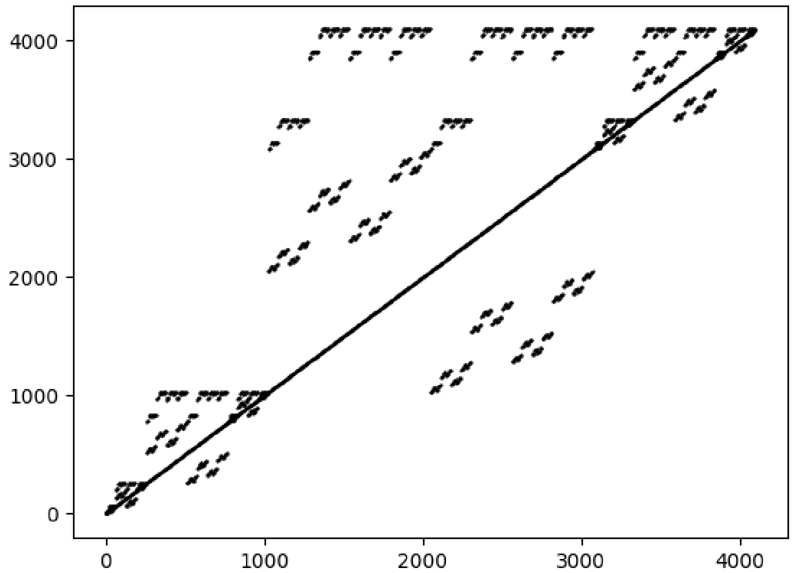

Figure 3: $a_4(n)$ for $n \in \{0, 1, ..., 4^6\}$.

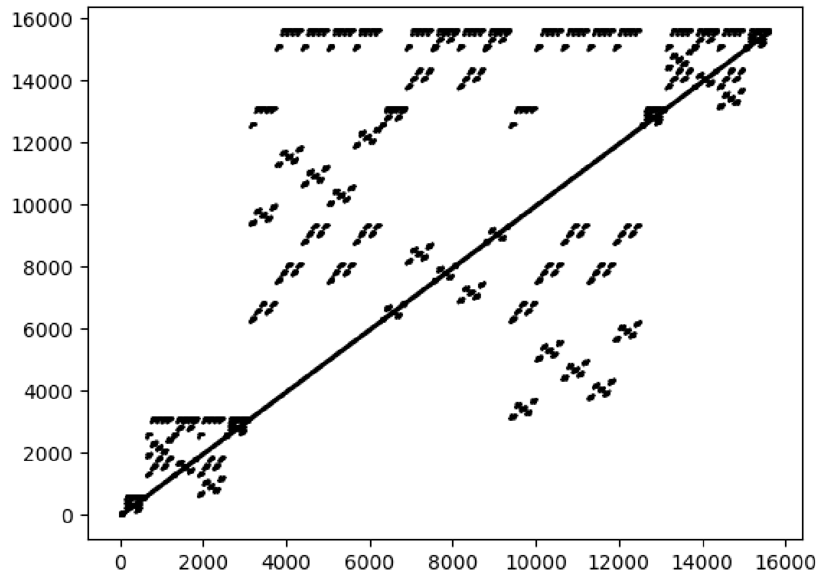

Figure 4: $a_5(n)$ for $n \in \{0, 1, ..., 5^6\}$.

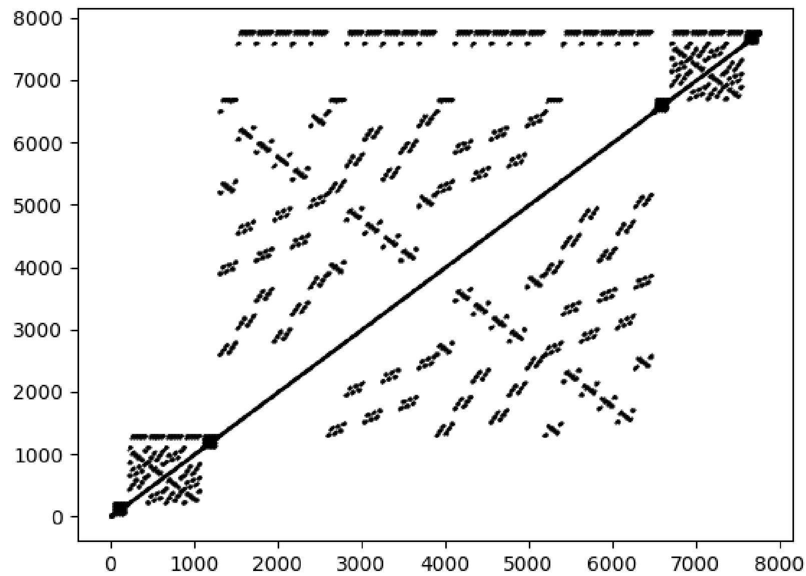

Figure 5: $a_6(n)$ for $n \in \{0, 1, ..., 6^5\}$.

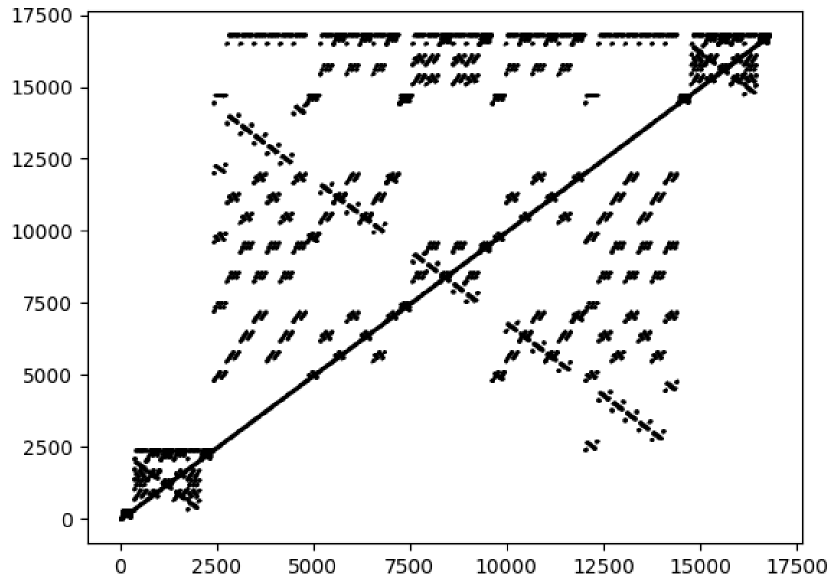

Figure 6: $a_7(n)$ for $n \in \{0, 1, ..., 7^5\}$.

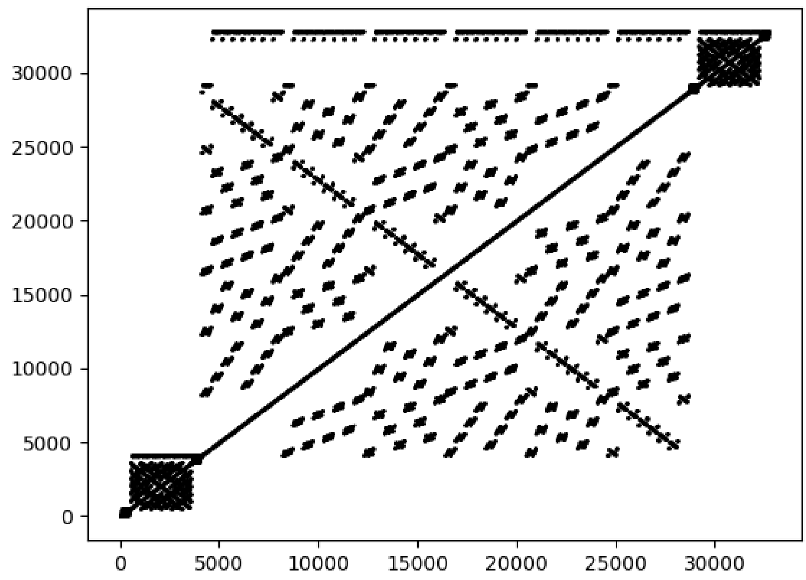

Figure 7: $a_8(n)$ for $n \in \{0, 1, ..., 8^5\}$.

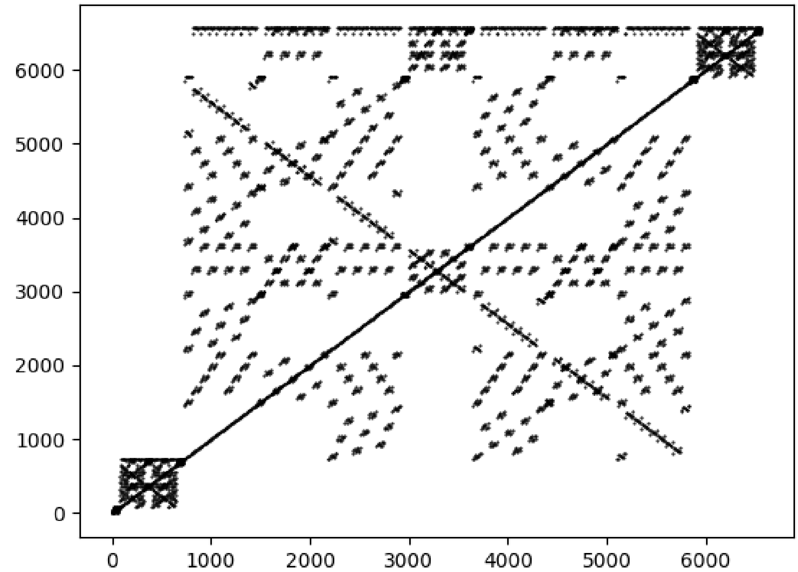

Figure 8: $a_9(n)$ for $n \in \{0, 1, ..., 9^4\}$.

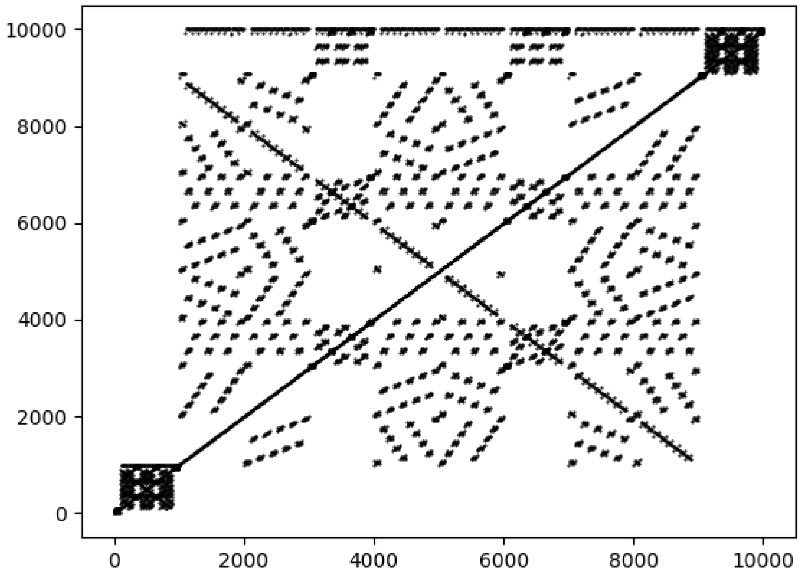

Figure 9: $a_{10}(n)$ for $n \in \{0, 1, ..., 10^4\}$.

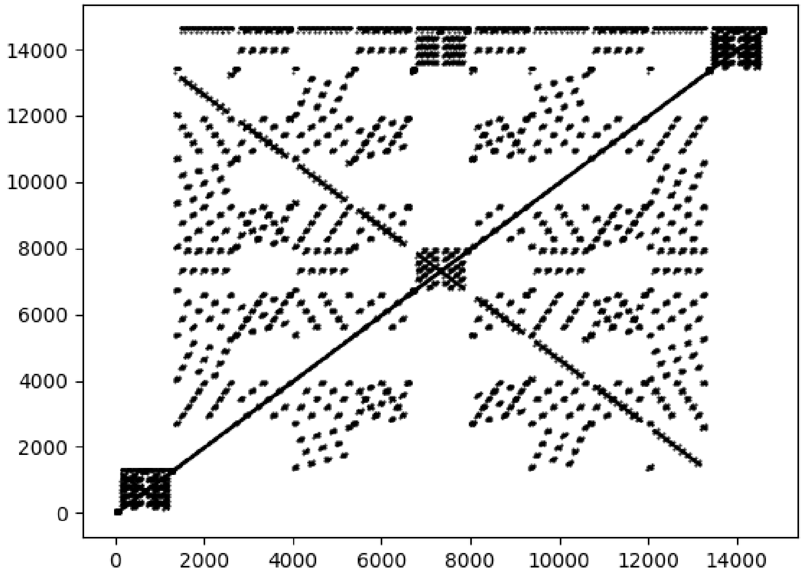

Figure 10: $a_{11}(n)$ for $n \in \{0, 1, ..., 11^4\}$.

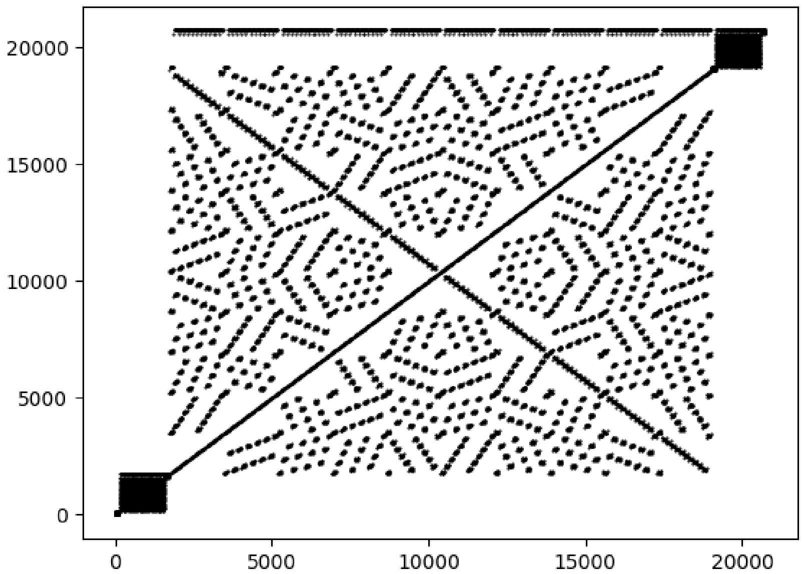

Figure 11: $a_{12}(n)$ for $n \in \{0, 1, ..., 12^4\}$.

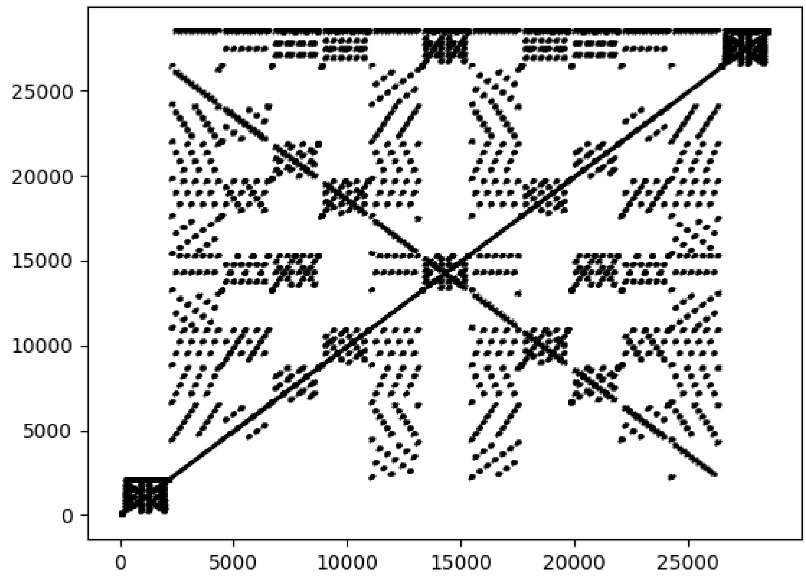

Figure 12: $a_{13}(n)$ for $n \in \{0, 1, ..., 13^4\}$.

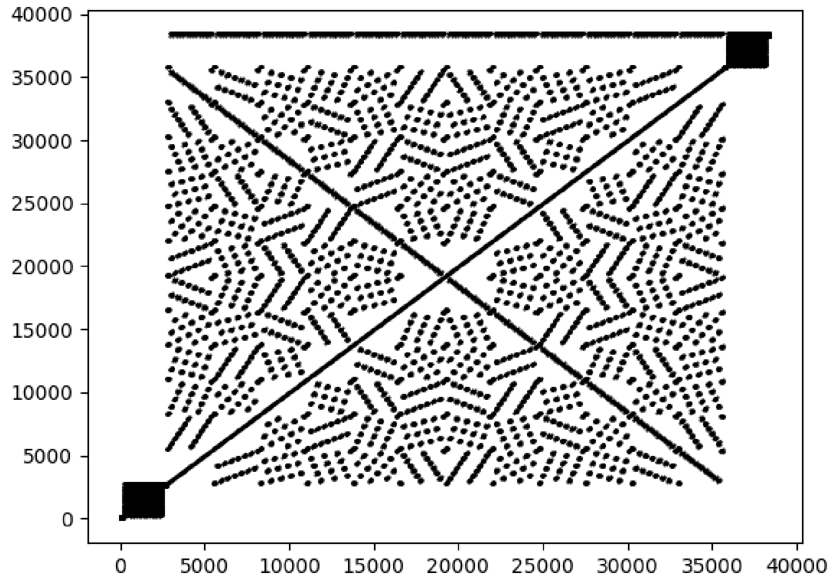

Figure 13: $a_{14}(n)$ for $n \in \{0, 1, ..., 14^4\}$.

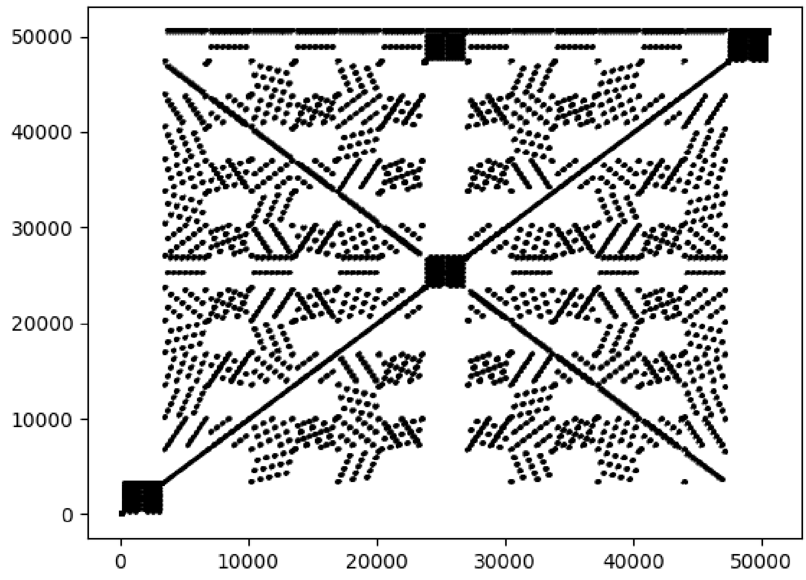

Figure 14: $a_{15}(n)$ for $n \in \{0, 1, ..., 15^4\}$.

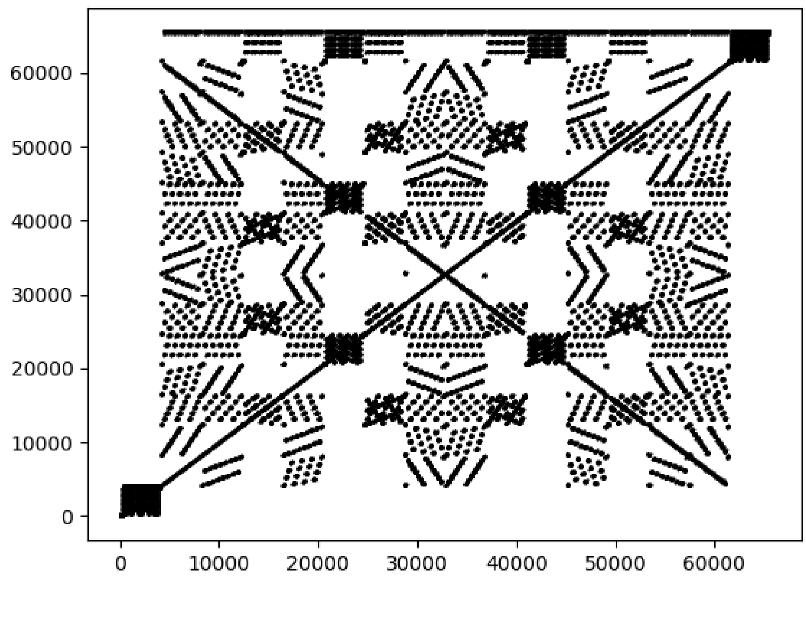

Figure 15: $a_{16}(n)$ for $n \in \{0, 1, ..., 16^4\}$.

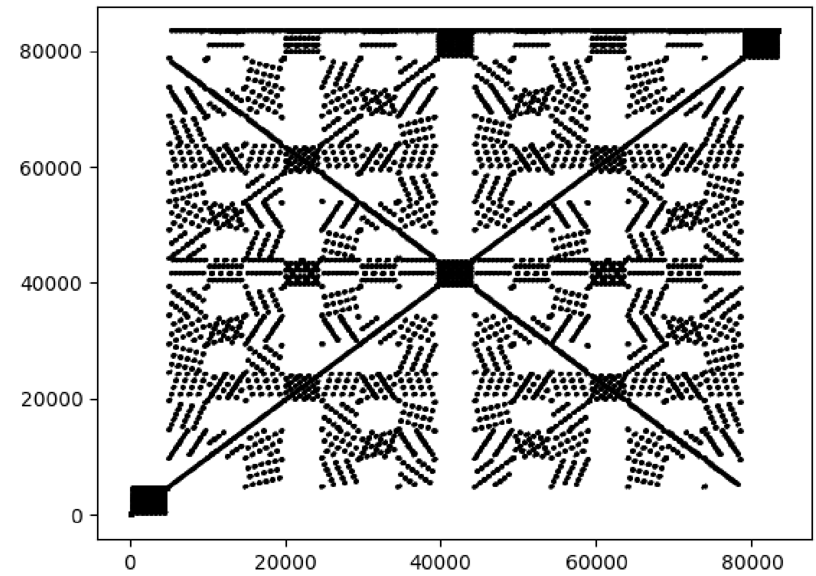

Figure 16: $a_{17}(n)$ for $n \in \{0, 1, ..., 17^4\}$.

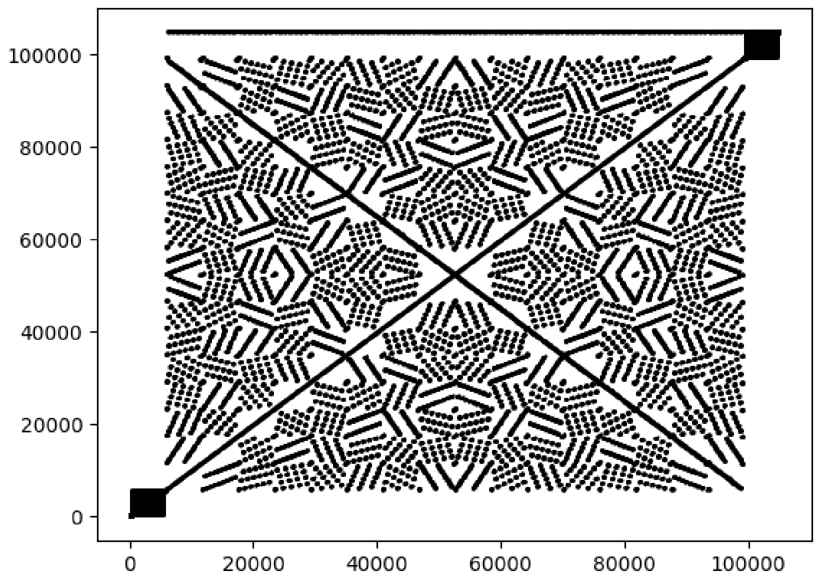

Figure 17: $a_{18}(n)$ for $n \in \{0, 1, ..., 18^4\}$.

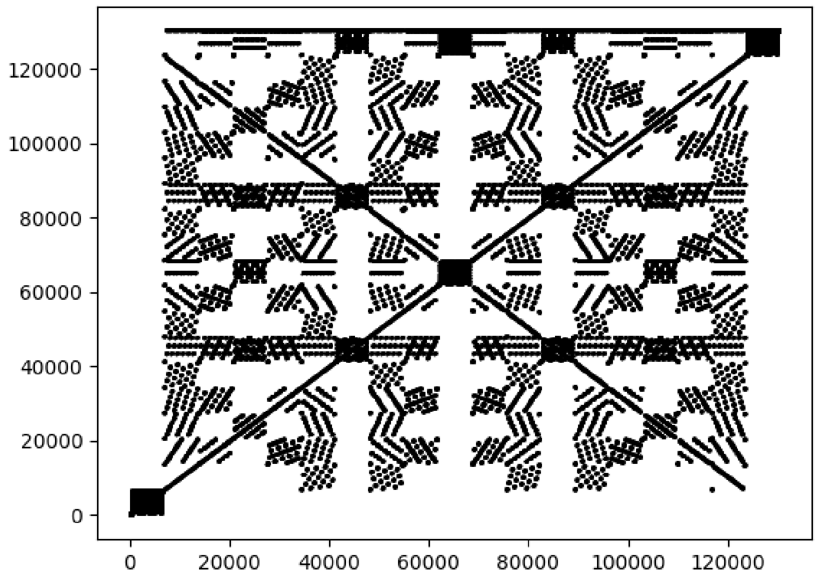

Figure 18: $a_{19}(n)$ for $n \in \{0, 1, ..., 19^4\}$.

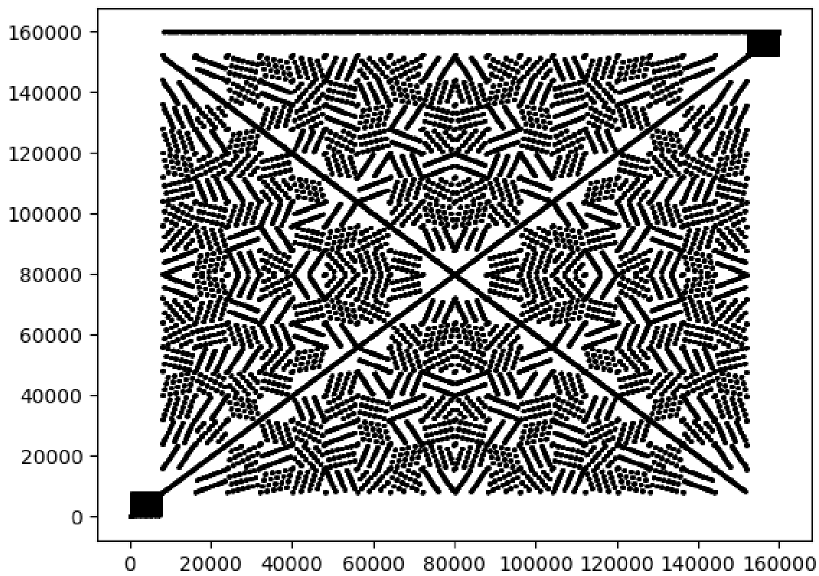

Figure 19: $a_{20}(n)$ for $n \in \{0, 1, ..., 20^4\}$.