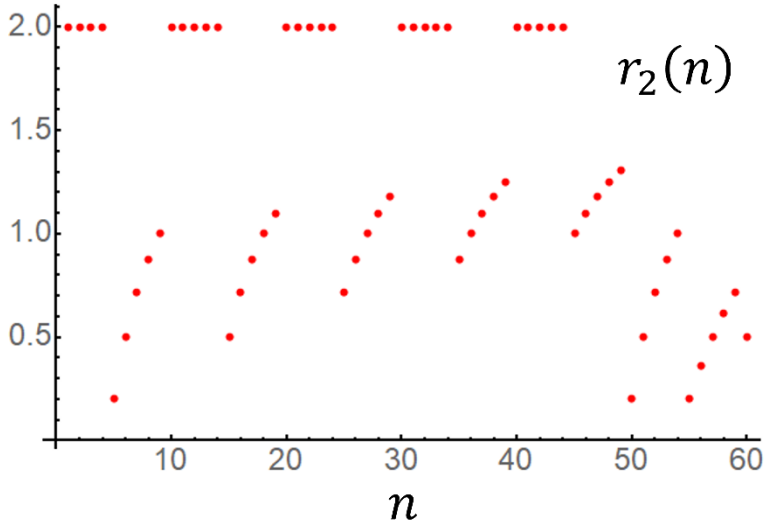
UC Merced Applied Math Problem of the Month

September 2022



Let $s(n)$ be the digit sum function of an integer n. For example, $s(256) = 2 + 5 + 6 = 13$. Consider the ratio $r_2(n) = s(2n)/s(n)$. For $n = 256$, $r_2 = s(512)/s(256) = 8/13$.

1. What are the minimum and maximum values of $r_2(n)$ for all integer numbers n?
2. How about $r_k(n) = s(kn)/s(n)$ for $k = 3, 4, 5, 6, 7, 8, 9$? That is, for each k, what is the range of $r_k(n)$ for all integers n?

To submit your solutions for a chance to win an Amazon gift card, and to find out detailed contest rules,

- scan the QR code to the right, or
- go to https://appliedmath.ucmerced.edu/news-events/problem-month