NMU Math & CS Department

Problem of the Month, February 2023

Consider the number $M = 11\ldots111$, with all of its n digits equal to 1.

For example: $M = 111$ when $n = 3$, $M = 1111$ when $n = 4$, and $M = 11111$ when $n = 5$.

Show that M is divisible by 41 if and only if n is divisible by 5.