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Wolke, Dieter (D-FRBG)
Primes with preassigned digits.
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In 1959, W. Sierpiński used Dirichlet's 1837 theorem on primes in arithmetic progressions to show that for any chosen base $g \geq 2$ there exist infinitely many primes that have the first digit b and the last digit b' when expressed in base g, where b, b' are any fixed integers from $\{1, 2, 3, \ldots, g-1\}$ and $(g, b) = 1$.

In this paper the author generalizes this theorem to "admissible" vectors L of digits, of lengths 1 and 2. In fact, he estimates the number of such k-digit primes (in base g) as

$$C_L\left(1-\frac{1}{g}\right)\frac{g^k}{\log g^k}+O\left(\frac{g^k}{k^2}\right) \quad \text{as } k \to \infty,$$

where C_L is a constant depending only on the digit vector L and the base g.

With the help of the Riemann Hypothesis for the L-functions with characters modulo p^m ($m \in \mathbb{N}_0$), it is also shown that the length of the "admissible" digit vectors could be increased considerably—all the way to $(1-\varepsilon)k^{1/2}$. The proofs of both of these theorems are nice and compact.

Reviewed by *Filip Saidak*