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On Integers Whose Sum Is the Reverse of Their Product,
Fibonacci Quart. **61** (2023), no. 1, 28–41.

Abstract

We determine all pairs of positive integers (a, b) such that $a + b$ and $a \times b$ have the same decimal digits in reverse order:

$(2, 2), (9, 9), (3, 24), (2, 47), (2, 497), (2, 4997), (2, 49997), \dots$

Our recursive procedure for constructing such pairs naturally extends to all numerical bases. We also investigate several phenomena related to the structure of the set of pairs that arise for a given base, and we give a visual interpretation of our construction in terms of deterministic finite automata.