Problem 56 - Powerful Digit Sum

Gautam Manohar

16 July 2018

This document originally appeared as a blog post on my website. Find it at gautammanohar.com/euler/56.

1 Problem Statement

Considering natural numbers $a, b \leq N$, which number of the form a^b has the maximum digital sum?

2 My Algorithm

For each $a, b \leq N$, we simply compute a^b in $\log b$ time and store its digital sum if it is maximal so far. This solution has time complexity $O(N^2 \log N)$.