# Problem 4 - Largest Palindrome Product

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## 1 Problem Statement

A palindromic number reads the same both ways. The smallest 6 digit palindrome made from the product of two 3-digit numbers is $101101 = 143 \cdot 707$.

Find the largest palindrome made from the product of two 3-digit numbers which is less than $N$.

## 2 My Algorithm

There are less than $10^6$ possible products of two 3-digit numbers, so brute force is a possible solution. We compute all products $ij$ of numbers $100 \leq i, j \leq 999$. If they are palindromic (the reversed string of $ij$ is identical to the string of $ij$), we keep them. Then we sort the palindromic products and perform a binary search for the greatest element of the array strictly less than $N$. The only tricky thing here is to remember that if $N$ is in the array of palindromic products, we must return the element directly before $N$.