Math Challenge Problem
for early October, 2011

Always Borrow

Before the age of calculators, you would subtract 438 from 624 like this:

$$
\begin{array}{r}
{\scriptstyle 5\ \ \ ^{1}1} \\[-2pt]
6\ 2\ ^{1}4 \\
-\ 4\ 3\ 8 \\
\hline
1\ 8\ 6
\end{array}
$$

Note that you had to "borrow" to complete the subtraction. By contrast, $547 - 245$ can be computed without borrowing.

The Challenge: What is the size of largest collection of three digit numbers for which borrowing must be used to compute $a - b$ for every pair of numbers (with $a > b$) in the collection?

Look for a new Challenge Problem in late October.