



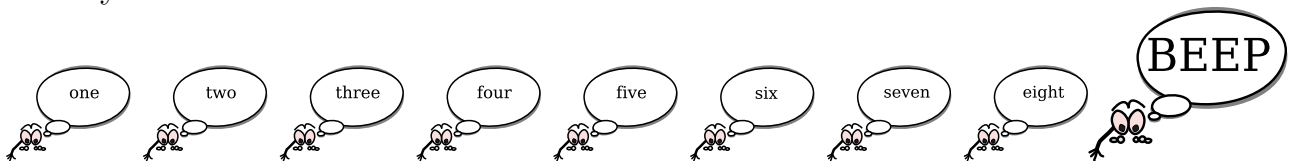
# Problem of the Week

## Problem D

### Beep Beep

The game *Beep* is played by a group of people counting up through the positive integers from 1. The first person says “one”, the second “two”, and so on. However, every time a multiple of 9, or a number containing the digit 9 is encountered, to avoid losing, the person must say “beep” instead of stating the number. For example, one part of the game would sound like this: “twelve”, “thirteen”, “fourteen”, “fifteen”, “sixteen”, “seventeen”, “beep”, “beep”, “twenty”. “Eighteen” is replaced by “beep”, since it is a multiple of 9, and “nineteen” is replaced by “beep”, since it contains the digit 9.

What number would they need to make it to in order to have heard “beep” exactly 300 times?



Did you know that a number is divisible by 9 exactly when the sum of its digits is divisible by 9? For example, the number 214578 is divisible by 9 since  $2 + 1 + 4 + 5 + 7 + 8 = 27$ , which is divisible by 9. In fact,  $214578 = 9 \times 23842$ .

