



Problem of the Week

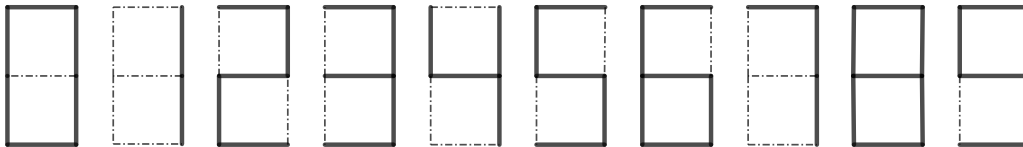
Problem D

Seven Segments or Less

A 7-segment display consists of seven LEDs arranged in a rectangular fashion, as shown below. Each of the seven LEDs is called a segment because, when illuminated, the segment forms part of a numerical digit to be displayed. On a digital clock, each digit can be formed by lighting up some of the seven segments of the following 7-segment display.



Below, each of the digits from 0 to 9 are shown by lighting up some of those seven segments. For example, the digit 8 uses all seven segments, but the digit 1 uses only the two right vertical segments.



If a segment burns out, there could be a problem distinguishing which digit is showing. For example, if the top segment is burnt out then the display to the right could still be the digit 1 or it could be the digit 7.



However, if the bottom right vertical segment is the only segment burnt out, then we can unambiguously determine that the digit on the right must be the digit 7.



What is the fewest number of working segments that are needed so that each digit can be unambiguously determined?

