G51APS, Algorithmic Problem Solving
Coursework 4, 2011/2012
Games

School of Computer Science
University of Nottingham

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Abstract

Model solutions.

a) See fig. 1. m is a winning position if $m \bmod 5 \geq 2$.

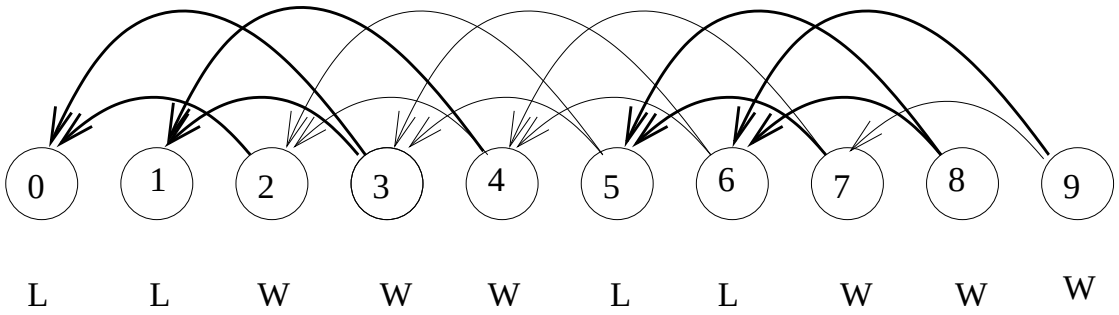

Figure 1: Winning moves shown in bold.

(b) See table 1.
(c) A combination of two losing positions is always a losing position, a combination of a winning position and a losing position is always a winning position, but the combination of two winning positions may be a winning position or a losing position. The third entry in the table (the pair $(12, 18)$) is a winning position that is a combination of two winning positions; the fourth entry is a losing position that is a combination of two winning positions.

Left Game	Right Game	"losing" or winning move
5	5	R1
10	22	R2
12	18	R1
14	2	losing
33	12	L2

Table 1: Winning moves. (Others may be possible.)