You are among the first class of recruits at Bumble & Dumble, a fledgling spy school. You've aced all the tests so far, and now it's time for your final exam: You must break into the enemy's secret headquarters. In order to do this, you have to get through a series of doors with special locks. To open them, you must correctly place a specially coded string of beads into the compartments of a box by each door.

Each string repeats a regular pattern (1-2-3-1-2-3...) and consists of the same number of beads as there are compartments in the box. The first bead (1) is always placed in the upper-left compartment; then you must place the

string one bead per compartment, moving either horizontally or vertically, but not diagonally.

Unfortunately, the only other information you have for each lock is given below. If a bead is shown with only one string, no other strings are attached to that bead. If no strings are shown, the bead might have either one or two strings connected to it. An empty (non-numbered) bead could be of any number. Sometimes the given information tells you what number of bead is in a compartment, or shows you that two compartments are connected by the string. Can you

