

Homework #1 (*not used for evaluation*)

The Problem

Peter has a couple of crystal balls and he would like to test how hard they are. He finds a stair (Figure 1) with n steps: $1, 2, \dots, n$. He wants to find the smallest step i such that his ball will break if it is dropped from the top of the stair. (In other words, the ball will not break for all steps $j < i$ and it will break for all steps $j \geq i$.)

1. If Peter can only use exactly one ball, how can he design a fast algorithm to find i ?
2. If Peter can only use exactly two balls, how can he design a fast algorithm to find i ?

In both cases, once a ball is broken Peter can't use a replacement.

