Complete Mathematics

Christmas Catastrophe!

In a catastrophic chain of events Rudolph (the red nose reindeer) was taken ill a matter of hours before Christmas eve!

Without Rudolph showing the way, Father Christmas is not going to be able to deliver his presents. Luckily two clever elves have come up with an idea.

The elves suggest attaching lightbulbs to the front of the sleigh in a diamond pattern (see diagram below).

x 1 Lightbulb
x 2 Lightbulb
⋮
x 100 Lightbulb
⋮
x 2 Lightbulb
x 1 Lightbulb
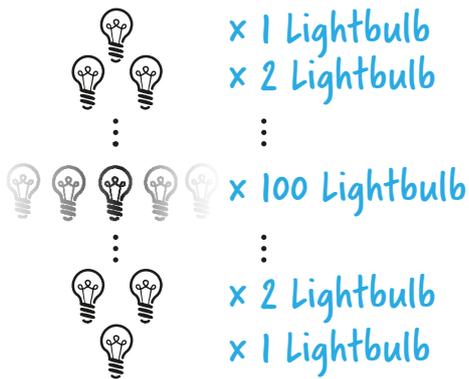
There will be 1 bulb in the first row, 2 bulbs in the second and so on until the 100th row, where there will be 100 bulbs. Then the 101st row will have 99 bulbs and this will continue to decrease until the last row with 1 bulb.

Before the elves start retrofitting the sleigh they need to see if they have enough bulbs to carry out the plan.

Time is of the essence so can you find a quick way to work out how many bulbs are needed?