lampoon [læm'pun] ridicule; spoof
polemical [pə'lɛmɪkl] causing debate or argument
reticent ['rɛtɪsnt] restrained; holding something back; uncommunicative
equilibrium [,ikwɪ'lɪbrɪəm] state of being balanced
amalgamate [ə'mælgəmet] mix; combine; unite societies
adulteration [ə,dʌltə'reʃən] making unpure; poorer in quality
poseur [po'zɝ] a person who attempts to impress by acting unlike himself
narcissism ['nɑrsɪ'sɪzəm] self-love
flop [flɑp] fail/move/fall clumsily
aberration ['æbə'reʃən] straying away from what is normal
superimpose [,supərɪm'poz] put something on the top
boisterous ['bɔɪstərəs] noisy; restraint
incongruous [ɪn'kɑŋgruəs] out of place; not in harmony or agreement
multifarious [,mʌltɪ'fɛrɪəs] varied; motley; greatly diversified
hapless ['hæplɪs] unlucky
imminent ['ɪmɪnənt] likely to come or happen soon
apprehensive [,æprɪ'hɛnsɪv] grasping understanding fear unhappy feeling about future
complaisance [kəm'plezns] tending to comply obliging willingness to please
supersede [,supɚ'sid] take the place of
inept [ɪ'nept] unskillful; said or done at the wrong time

Puzzle

There is a 100-floor building with a special floor x. You have two same glass balls. Suppose one glass ball can be thrown out from a floor (e.g. y). If y < x, this ball will not be broken and you can reuse it. But if y >= x, this ball will be broken and you can't use this ball again. Design a optimal strategy to find the floor x.

Solution

Main Idea:

Try to guarantee the total times of throwing ball to be the same, whenever the first glass ball is broken. So the interval that we throw the first glass ball should minus 1 at every time if it is not broken.

Details:

Suppose throw the first ball at floor f at the first time. If it is broken, use the second ball to search every floor from 1 to f-1 (total 1+f-1=f times in the worst case). if not, throw the first ball at floor (f + f-1). Now if the first ball is broken, throw the second ball floor by floor from floor f+1 to floor 2f-1 (total 2 + (2f-1-(f+1)) = f times in the worst case). And so on. Simultaniously, you should can search all the floor, so:

$$\min f$$

$$\text{s.t } f + f-1 + f-2 + f-3 + \dots + 2 + 1 >= 99$$

Then we can solve out that f = 14

The best strategy: throw the first glass ball in 14, 27, 39, 50, 60, 69, 77, 84, 90, 95, 99