- Interactively determine the lot with the highest value from a square so that the NWERC jury can decide on which problem idea to use.

- The size of the square is n^2 ($1 \le n \le 100$) and is not known beforehand.

- The values of the lots ($1 \le v \le 10^9$) are unique.

- Trying to draw a lot outside the square gives "`ArrayIndexOutOfBoundsException`".

- You can use at most $n^2 + 100$ queries.

Do not worry, they made up with hot cocoa and stroopwafels afterwards. Generated using imgflip.com

Brothers in Arms

Time limit: 5s   Problem Author: Markus Himmel

- Compute the friendship degree for pairs of cities.
- There are $2 \le n \le 90\,000$ cities, $2 \le s \le 300$ symbols, and $1 \le q \le 10^5$ queries.
- Two cities are directly friendly (degree $= 1$) if they share a symbol at the top *or* at the bottom of their coats of arms.
- Two cities c_0 and c_f are indirectly friendly if there exist cities $c_1, \ldots, c_{f-1}$ such that c_k is friendly with c_{k+1} for $0 \le k < f$ (for minimal f).

Illustration of Sample Input 1. Cities 1 and 2 are directly friendly, as well as cities 2 and 3.
Cities 1 and 3 have a friendship degree of 2, because they are indirectly friendly via city 2.
City 4 is not (indirectly) friendly with any other city.

Parts of these coats of arms are CC BY-SA 4.0 on Wikimedia Commons.

- Calculate the diameter of a cup that can perfectly fit a stroopwafel with a given area ($0 < a \leq 10^{15}$).

A stroopwafel on a slightly too small cup.
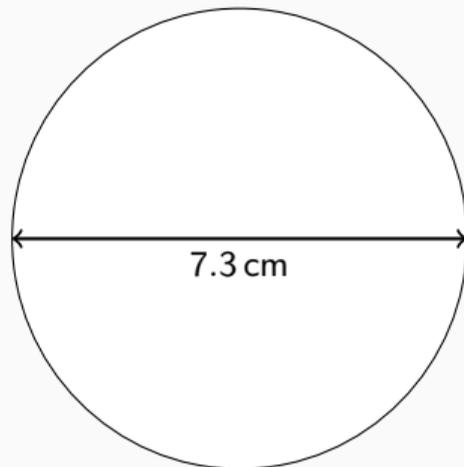
7.3 cm

Illustration of Sample Input 1, which has an area of $42\,\mathrm{cm}^2$ and a diameter of 7.3 cm.