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## Final exams

P87812\_en

Novè Concurs de Programació de la UPC - Semifinal (2011-06-29)

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Professor Oak is dealing with the final exams of his course. He can either:

- Put an exam on top of the other exams on his desk.
- Remove the exam on top.
- Check which is the best qualification among the exams on his desk.

Please help him to do it efficiently.

### Input

To avoid large input files, the commands and numbers will be pseudo-randomly generated. The integer sequence will be produced by the following linear congruential generator:

```
A := 8433437992146984169
B := 7905438737954111703
X := S // initial seed
function nextinteger():
    X := (A*X + B) mod 2^64
    return X / 2^32
```

For each number  $y$  returned, the command will be:

- “Put”, if  $y \not\equiv 0 \pmod{4}$ . The grade of the exam will be the next pseudo-random number generated, which should not be counted as a command.
- “Remove”, if  $y \equiv 0 \pmod{4}$  and  $y \not\equiv 0 \pmod{8}$ .
- “Check”, if  $y \equiv 0 \pmod{4}$  and  $y \equiv 0 \pmod{8}$ .

Input consists of several cases, each with the number of instructions (between 0 and  $10^6$ ) and the initial seed  $S$  (between 0 and  $2^{64} - 1$ ). Print “EMPTY DESK” every time that Prof. Oak tries to remove an exam or check the best qualification but there are no exams on his desk.

### Output

For every case, print the best qualification for every query, together with the error messages. Print a blank line after every case.

#### Sample input

```
9 3
19 18446744073709551614
1 10
```

#### Sample output

```
3931067935
EMPTY DESK
4132970100

4208990443
4208990443

EMPTY DESK
```

**Problem information**

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