Problem J. Books

DreamGrid went to the bookshop yesterday. There are n books in the bookshop in total. Because DreamGrid is very rich, he bought the books according to the strategy below:

- Check the n books from the 1st one to the n-th one **in order**.
- For each book being checked now, if DreamGrid has enough money (not less than the book price), he'll buy the book and his money will be reduced by the price of the book.
- In case that his money is less than the price of the book being checked now, he will skip that book.

BaoBao is curious about how rich DreamGrid is. You are asked to tell him the maximum possible amount of money DreamGrid took before buying the books, which is a non-negative integer. All he knows are the prices of the n books and the number of books DreamGrid bought in total, indicated by m.

Input

There are multiple test cases. The first line of the input contains an integer T, indicating the number of test cases. For each test case:

The first line contains two integers n and m ($1 \leq n \leq 10^5$, $0 \leq m \leq n$), indicating the number of books in the bookshop and the number of books DreamGrid bought in total.

The second line contains n non-negative integers $a_1, a_2, ..., a_n$ ($0 \leq a_i \leq 10^9$), where a_i indicates the price of the i-th book checked by DreamGrid.

It's guaranteed that the sum of n in all test cases will not exceed 10^6.

Output

For each test case output one line.

If it's impossible to buy m books for any initial number of money, output "Impossible" (without quotes).

If DreamGrid may take an infinite amount of money, output "Richman" (without quotes).

In other cases, output a non-negative integer, indicating the maximum number of money he may take.

Example

standard input	standard output
4 4 2 1 2 4 8 4 0 100 99 98 97 2 2 10000 10000 5 3 0 0 0 0 1	6 96 Richman Impossible