

Heroes of Money and Magic

Input file: **stdin**
Output file: **stdout**
Time limit: 2 seconds
Memory limit: 256 megabytes

Boondex company has recently got through an IPO procedure and now trades its shares on a stock exchange. Now it has a history of its share prices for some period of time. For the new marketing event company wants to calculate the maximum amount of money one could have earned if he speculated on Boondex shares in that period of time.

Boondex shares are non-divisible for the purpose of buy/sell operations. They are also so highly liquid that any operation on stock exchange with Boondex shares can be executed in any amounts at any time.

Stock exchange has some fee for each operation that is executed by the investor. The fee is flat rate and fixed. It is collected before each transaction for "buy shares" operations and after each transaction for "sell shares" operation. If fee collection is not possible due to insufficient amount of investor's money, such operations are not permitted.

Investor must sell all his Boondex shares by the end of the last day.

Input

In the first line of input integers N , M and F are given — the number of days with price information ($1 \leq N \leq 10^5$), the amount of money investor has initially ($1 \leq M \leq 10^5$) and a fee F ($1 \leq F \leq 10^5$) for each exchange operation. On the next N lines of input integers P_i ($1 \leq P_i \leq 10^5$) are given — the price of one Boondex share on i -th consecutive day. It is guaranteed that the answer for this problem is less than 10^{18} .

Output

Print on the first line the maximum amount of money investor could possibly have after N days.

Next N lines should indicate investor's actions for each day on stock exchange to achieve this result: output positive number of shares he should buy on that day, negative number of shares he should sell on that day or zero if he should abstain of any operations on that day.

Examples

stdin	stdout
3 10000 1 4000 4004 4002	10006 2 -2 0
3 10000 1 4001 4000 4004	10006 0 2 -2