Bus Wheels (1 Point)

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

points: 100 · problem code: buswheels · author: glipR

> m wheels on the bus go round and round,
>
> breaking down,
>
> breaking down.
>
> n wheels on the bus are lying around,
>
> All the way to town.

The m-wheeled school bus is taking an extremely long journey on a very bumpy road. Unforunately you haven't got the budget for an all-terrain school bus, and so your wheels are looking worse for wear.

Luckily, the bus is carrying no children, which leaves a lot of space for spare wheels!

You are trying to drive as far as possible, however each of your n wheels is rated for a particular distance k metres, after which they will break. Each wheel that breaks then needs to be replaced, which takes t seconds per wheel. It doesn't take any time to begin putting the initial m wheels on your bus.

The bus travels at 1m/s, and you want to maximise how far you've travelled after x seconds.

Input

Input will begin with 4 space-separated integers, n, m, t, x, which are:

- The number of wheels in your possession
- The number of wheels the bus requires to move
- The time it takes to replace a single wheel
- The time we have to travel as far as possible

A second line containing n space-separated integers will follow, representing the distance rating for each of the n wheels.

Output

Output a single integer, the furthest your bus can travel after x seconds.

Constraints

- $1 \leq n \leq 10^5$
- $1 \leq m \leq 20$
- $1 \leq t \leq 10^6$
- $1 \leq x \leq 10^{15}$
- $1 \leq k \leq 10^8$ (Distance rating)

Example

For the input

```
10 4 3 15
8 3 5 7 3 2 1 3 5 6
```

The correct output would be `7`. This is because we can travel `7` metres by starting off with these 4 wheels to begin:

`8 7 5 5`

Then, after travelling for 5 metres, two wheels need replacing, taking 6 seconds. We replace these with wheels of length `3` and `2` (Both taking 3 seconds to replace).

`8 7 3 2`

After another 2 metres travelled, the 7 wheel and 2 wheel both need replacing, but by this point we've already taken 13 seconds, so replacing these two wheels would take us over 15 seconds.