Question Two [50 marks]

File names

- Use scoring.c if you are writing your program in C.
- Use scoring.cpp if you are writing your program in C++.
- Use Scoring.java if you are writing your program in Java.

Note that case matters.

Problem Description

Write a program that accepts as input a list of *N* positive integers, $V_1, \ldots, V_N$, and a target score, *T*. Starting with a score of 1 point, the program will process the list of numbers in order, in each case, choosing whether to add the number to the current score, or to multiply the current score by it. The object is to find the maximum score that can be achieved that is *less* than *T*.

Example

Given *N* = *4* numbers, <*4, 2, 3, 5*>, and a target of *T* = *40*, one possible score is achieved as follows:

Starting with 1,
* 4 = 4
* 2 = 8
+ 3 = 11
* 5 = 55

But 55 is larger than the target of 40.

The maximum score (less than 40) that can be achieved is in fact 35. It is obtained as follows:

Starting with 1,
+ 4 = 5
* 2 = 10
* 3 = 30
+ 5 = 35

Input and Output

Program input and output will make use of stdio streams (System.in and System.out in Java) i.e., not file I/O.

Input consists of a series of integer values, each on a separate line. The first value is for *N*, the number of integers in the list, followed by the values for those integers $(V_1, \ldots, V_N)$, followed by the value for the target score, *T*.

Output consists of a single integer, the maximum score which can be achieved that is *less* than *T*, followed by a line break —in Java, for example, use System.out.println, not System.out.print. The automatic marker expects this precise form.

Sample Input:

```
4
4
2
3
5
40
```

Sample output:

```
35
```

Constraints

$1 \le N \le 20$
$1 \le V_i \le 1{,}000$
$1 \le T \le 1{,}000{,}000$

Automarker Trials

Trial 1
N: 1
List: [2]
T: 3
Output: 0

Trial 2
N: 2
List: [3, 3]
T: 7
Output: 0

Trial 3
N: 5
List: [5, 5, 4, 3, 2]
T: 148
Output: 145

Trial 4
N: 5
List: [50, 92, 67, 58, 82]
T: 600
Output: 442

Trial 5
N: 10
List: [13, 1, 2, 1, 12, 3, 37, 23, 29, 1]
T: 1430
Output: 1313

Trial 6
N: 8
List: [2, 4, 7, 2, 3, 5, 7, 3]
T: 974798
Output: 246960

Trial 7
N: 11
List: [14, 1, 11, 1, 7, 1, 39, 804, 16, 24, 6]
T: 5911
Output: 5658

Trial 8
N: 20
List: [12, 20, 406, 12, 157, 4, 44, 467, 664, 4, 924, 614, 795, 56, 586, 18, 700, 62, 2, 605]
T: 83633
Output: 68174

Trial 9
N: 15
List: [23, 362, 710, 26, 95, 845, 1, 69, 29, 1, 3, 1, 4, 6, 18]
T: 876331
Output: 875280

Trial 10
N: 20
List: [727, 478, 404, 2, 35, 41, 2, 4, 18, 466, 1, 1, 48, 878, 332, 277, 277, 789, 56, 120]
T: 931478
Output: 906309