

COMP3000 – 2014/2015S2
Assignment 2

Due: 11:59 p.m., February 15, 2015

Given a set of N stamp values (e.g., {1 cent, 3 cents}) and an upper limit K to the number of stamps that can fit on an envelope, calculate the largest unbroken list of postages from 1 cent to M cents that can be created.

For example, consider stamps whose values are limited to 1 cent and 3 cents and suppose that you can use at most 5 stamps. It's easy to see how to assemble postage of 1 through 5 cents (just use that many 1 cent stamps), and successive values aren't much harder:

- $6 = 2 \cdot 3$
- $7 = 2 \cdot 3 + 1$
- $8 = 2 \cdot 3 + 2 \cdot 1$
- $9 = 3 \cdot 3$
- $10 = 3 \cdot 3 + 1$
- $11 = 3 \cdot 3 + 2 \cdot 1$
- $12 = 4 \cdot 3$
- $13 = 4 \cdot 3 + 1$

However, there is no way to make 14 cents of postage with 5 or fewer stamps of value 1 and 3 cents. Thus, for this set of two stamp values and a limit of $K=5$, the answer is $M=13$.

The first line of the input file has K , the total number of stamps that can be used, followed by N , the number of stamp values. The second and subsequent lines list all the N stamp values, 15 per line. Your job is to compute and print M , the number of contiguous postage values starting at 1 cent that can be formed using no more than K stamps from the set.

You may assume that $1 \leq N \leq 500$ and $1 \leq K \leq 500$. No stamp value will exceed 10,000. Integers (signed 32-bit) will be adequate for all solutions.

Sample input (file **input.txt**):

```
5 2
1 3
```

Sample output (file **output.txt**):

```
13
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