7768   Jupiter Orbiter

Although we imagine interplanetary probes to be very sophisti-
cated pieces of technology, their information systems are quite
archaic. You might assume that they have a certain amount of
contiguous main memory and can store their data wherever is
convenient, but unfortunately that is not the case. The probe's
main memory is organised in a number of FIFO (first-in-first-out)
queues. In such a queue, data has to be taken out of the queue
in the same order as it has been added to it.

The Juno spacecraft in front of Jupiter. Graphic by NASA

A probe has multiple sensors and each sensor is linked to one
of the queues. Whenever a sensor finishes recording, it appends
the generated data to its queue. A sensor can write data to the
queue only if the queue has enough space left to take all the data;
if not, the data is lost.

In order to transfer data from the probe to Earth (in a process called *downlinking*), the path between
the satellite and Earth must not be blocked by anything (e.g. a planet like Jupiter) and the antenna
must be correctly positioned. During each downlink opportunity, data can be taken from multiple
queues and transmitted back to Earth. The total amount of data that can be transmitted during
a downlink opportunity depends on the length of the downlink opportunity and distance to Earth.
Sensors do not collect data during downlink opportunities, since all electricity available is devoted to
the transmitter.

The most important thing for scientists is not to lose any data recorded by sensors. In particular,
all queues have to be empty after the last downlink opportunity. The scientists have asked you to write
a program to determine whether all data can be transferred to Earth in a given time frame.

Input

The input file contains several test cases, each of them as described below:

- one line containing three positive integers n, q, s ($1 \le n, q \le 30$, $1 \le s \le 100$), the number of
  downlink windows, FIFO queues, and sensors, respectively.

- one line with s integers $q_1 \ldots q_s$ ($1 \le q_i \le q$ for each i), determining for each sensor the queue it
  feeds its data into.

- one line with q integers $c_1 \ldots c_q$ ($1 \le c_i \le 10^6$ for each i), determining for each queue the size of
  the queue in megabytes.

- n lines, each describing one downlink window. Each contains $s + 1$ non-negative integers.

  - The first integer d ($1 \le d \le 10^6$) states the number of megabytes that can be transferred to
    earth during the window.
  - The following s numbers $a_1 \ldots a_s$ ($0 \le a_i \le 10^6$ for each i) describing the amount of data (in
    megabytes) generated by each of the sensors after the last but before this downlink window.

There will never be new data during a downlink window.

Output

For each test case, output 'possible' if it is possible to transfer all data to Earth, and 'impossible' otherwise, on a line by itself.

Sample Input

```
2 2 2
1 2
3 3
5 2 2
5 2 2
2 2 2
1 2
3 3
1 2 2
5 2 2
```

Sample Output

```
possible
impossible
```