

The Josephus Problem

Warning: the following problem description contains scenes of violence.

Flavius Josephus, according to the American Heritager Dictionary of the English Language, was a Jewish general and historian who took part in the Jewish revolt against the Romans. His History of the Jewis War is the major source of information about the siege of Masada (72-73).

Josephus was not only an historian, but a general, and, it would seem, a cunning one at that. Another historian, Hegesippus, wrote in *De Bellu Judaico* that Josephus saved his life by solving a combinatorial problem in his head. The story goes that, after the Romans had captured Jotapat, Josephus and forty other Jews took refuge in a cave. The vast majority (in fact, all but Josephus and a comrade) wished to commit a mass suicide, so that they would not fall into the hands of their conquerors and perhaps be tortured into betraying their people.

According to this account, Joesphus did not wish to openly express opposition to this idea, but nonetheless wished to survive, and therfore declares that all persons present arrange themselves in a siccle, and that every third person be killed until only one remained, who would then commit suicide.

This problem asks you to determine which **J** positions out of a circle of **M** people should be chosen, so that the **J** people will survive, if every **K**th person is killed. Write on one line, the positions which should be chosen for **J** people to survive in the order that they would be chosen for termination should the activity have continued.

The data will consist of triples (M, K, J), (positive integers such that $M > J$) except for the last line which starts with -1 for the value of M.

For example:

- 1) In the Josephus case, which positions should Josephus and his comrade take if they are to be the last 2 survivors (i.e. the only 2) out of 41 people if every third person dies?
- 2) If the input is 10, 2, 5, which positions should be taken if 5 people are to survive and every 2nd person is killed?

Sample Input:

```
41 3 2
500 10 6
10 2 5
5 1 1
12 6 8
-1 -1 -1
```

Sample Output:

```
16 31
49 469 193 249 72 251
5 9 3 1 7
5
11 9 8 10 3 1 5 4
```