

## IOI'94 - Day 2 - Problem 3: The Circle



You have a circle, divided into sectors. You are given three positive numbers:  $n$  ( $n \leq 6$ ),  $m$  ( $m \leq 20$ ) and  $k$  ( $k \leq 20$ ).  $n$  is the number of sectors. Choose integers to place in each sector.

All integers have to be greater or equal to  $k$ . When the circle is filled you can use the integer in a single sector or add the integers in two or more adjacent sectors to make a new number. Using these new numbers you can create an unbroken sequence of all integers between  $m$  and  $i$  ( $m, m+1, m+2 \dots i$ ).

Your task is to choose integers for the sectors such that the largest number ( $i$ ) in the sequence is as high as possible. Figure 1 below shows how to generate all numbers from 2 to 21 (for  $n=5$ ,  $m=2$ ,  $k=1$ ). The ^-sign below the sectors shows which sectors to add together to make numbers in the sequence.

### Input Data

The `INPUT.TXT` file contains three integers ( $n$ ,  $m$  and  $k$ ). Example:

```
5
2
1
```

### Output Data

The file `OUTPUT.TXT` must contain:

- The highest number ( $i$ ) that can be generated with the list of numbers.
- All arrangements of numbers in a circle that produce a sequence from  $m$  to  $i$ . (One per line.) Each arrangement is a list of numbers starting with the smallest number (which is not necessarily unique).

(2 10 3 1 5) is NOT a valid solution, since it does not start with the smallest number. (1 3 10 2 5) and (1 5 2 10 3) must both be included in the output. Note that (1 1 2 3), (1 3 2 1), (1 2 3 1) and (1 1 3 2) should all be output.

The output for the example above might be:

```
21
1 3 10 2 5
1 5 2 10 3
2 4 9 3 5
2 5 3 9 4
```

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