

## Problem Rings

**Input File:** RingsIn.txt

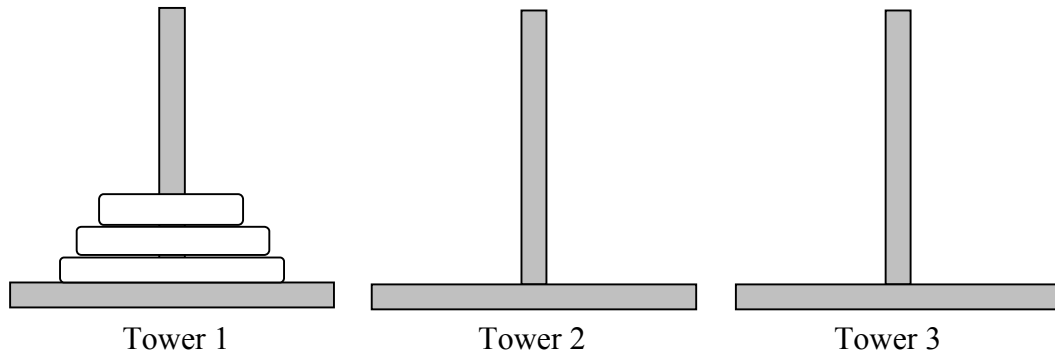
**Output File:** RingsOut.txt

**Project File:** Rings

You baby brother has been given a game that consists of a collection of  $n$  donut like rings, all of different radii, and three towers to stack them on. The game starts out with all the rings stacked on tower 1 in radius order, with the biggest ring on the bottom. The objective is to move the rings from tower 1 to tower 2 without violating the game's two rules:

- a) Rings must be moved from one tower to another, one at a time.
- b) A large ring cannot be placed on top of a small ring.

The rings can be placed on any of the three towers as long as these two rules are not violated. The starting condition of the game for three rings,  $n=3$ , is shown below.



Although you baby brother seems to have no trouble playing the game with one or two rings, he's having trouble playing the game with three or more rings. You have decided to write a computer program to output the sequence of moves for an arbitrary number of rings.

### Inputs

The first line of input consists of the number of games to be played. This line is followed by one input line per game. Each game's input line contain an integer: the number of rings for that game.

### Outputs

The moves to complete each game, one line per move. Each games output will be separated by a blank line.

### Sample input

```
3
1
2
3
```

### Sample output

Move 1 ring from tower 1 to tower 2

Move 1 ring from tower 1 to tower 3

Move 1 ring from tower 1 to tower 2

Move 1 ring from tower 3 to tower 2

Move 1 ring from tower 1 to tower 2  
Move 1 ring from tower 1 to tower 3  
Move 1 ring from tower 2 to tower 3  
Move 1 ring from tower 1 to tower 2  
Move 1 ring from tower 3 to tower 1  
Move 1 ring from tower 3 to tower 2  
Move 1 ring from tower 1 to tower 2