Problem L. LORELEI

Time limit: 1 second
Memory limit: 1024 mebibytes

You are given an integer X.

Consider a rectangular grid with N rows and M columns. You may choose the dimensions of the grid, as long as $1 \le N \le 10$ and $1 \le M \le 200$.

You may remove any number of cells from the grid. After removing these cells, you want to cover all remaining cells using 1×2 dominoes.

Each domino must cover exactly two remaining cells that share a side. Dominoes may be placed either horizontally or vertically, and they must not overlap. Every remaining cell must be covered by exactly one domino.

Two tilings are considered different if there exists a pair of cells covered by the same domino in one tiling but not in the other.

Find a grid such that the number of different tilings of the remaining cells is exactly X.

If the remaining cells cannot be completely covered by dominoes, the number of tilings is considered to be 0.

It is guaranteed that a valid answer exists under the given constraints.

Input

Each test contains multiple test cases.

The first line contains an integer t — the number of test cases.

Each of the next t lines contains an integer X.

Output

For each test case, print the following:

On the first line, print two integers N and M ($1 \le N \le 10$, $1 \le M \le 200$) separated by a space — the number of rows and the number of columns, respectively.

Then print N lines, each containing a string of length M, describing the grid.

The j-th character of the i-th line represents the cell in row i and column j.

Use `#` for a remaining cell and `.` for a removed cell.

The number of ways to completely cover all remaining cells with 1×2 dominoes must be exactly X.

If there are multiple valid answers, print any of them.

Constraints

- $1 \le t \le 100$
- $0 \le X < 2^{30}$

Examples

standard input	standard output
7 1 2 3 5 8 13 21	2 1 # # 2 2 ## ## 2 3 ### ### 2 4 #### #### 2 5 ##### ##### 2 6 ###### ###### 2 7 ####### #######
3 0 0 1	2 2 ## #. 1 1 # 1 1 .
2 2 0	6 22 ######..#....#..#....# #....#..#....#..##...# ######..#....#..###..# #..#....#....#..#.##.# #..##...#....#..#..### #...##..######..#...## 7 31 #...#...###...###..#####..##### #..#...#...#...#...#........#.. #.#....#...#...#...#........#.. ##.....#####...#...#####....#.. #.#....#...#...#.......#....#.. #..#...#...#...#.......#....#.. #...#..#...#..###..#####....#..