Problem F. Figures Of Simple Sense

Input file:	`foss.in`
Output file:	`foss.out`
Time limit:	2 seconds
Memory limit:	256 megabytes

Do you think that drawing polygons is easy? This is not the case when you have some restrictions.

In this problem all you have to do is just to draw a polygon. It must have exactly N vertices. It must contain no self-intersections. No three consecutive vertices of the polygon must be collinear. All coordinates of its vertices must be integers between 0 and 10 000, inclusive. Easy, right?

There is one more small restriction though. The number of inner angles of this polygon equal to 90° must be as large as possible under these constraints. What do you think about it now?

Input

The input file contains the number of test cases T ($1 \le T \le 30$) followed by T integer numbers N ($3 \le N \le 1000$).

Output

For each test case, output the maximum possible number of inner angles equal to 90° followed by N pairs of integers — the coordinates of the vertices of the polygon in either clockwise or counterclockwise order. Of course, more than one solution is possible, so output any of them.

Examples

foss.in	foss.out
2 4 6	4 0 0 1 0 1 1 0 1 5 1 1 3 3 5 1 4 0 3 1 2 0