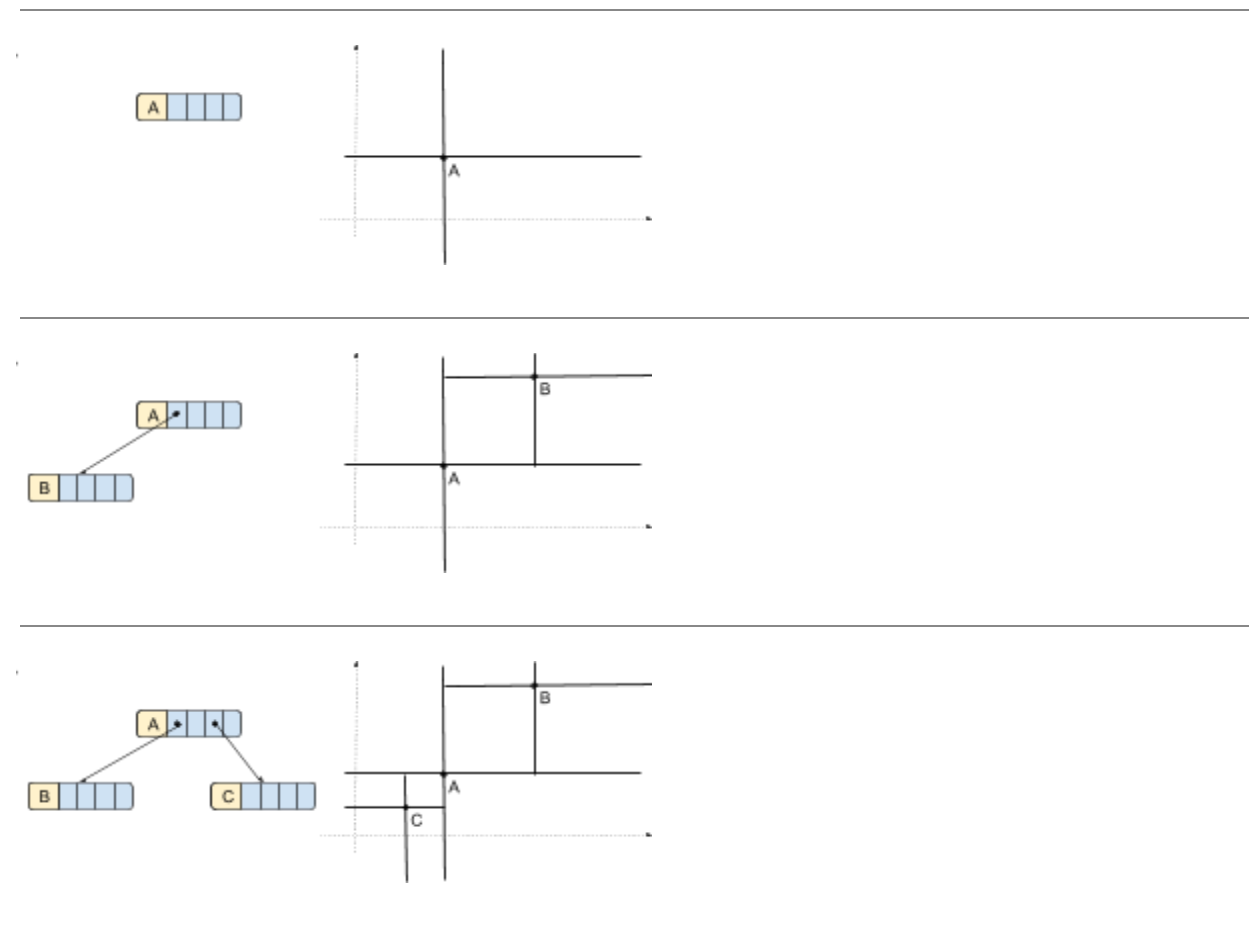**PROBLEM:** A *quadtree* is a tree data structure in which each internal node has exactly four children. Quadtrees are typically used to partition a two-dimensional space by recursively subdividing it into four regions.

In this program, we will build a *point quadtree* to represent two-dimensional points. A point from the data set is the center of each subdivision.

Point quadtrees are constructed as follows. Given the next point to insert, we find the region in which it lies and subdivide that region with vertical and horizontal lines that run through the point. Each node in the tree has the id of the point and four pointers to children nodes. The children, from left to right, are to the northeast, northwest, southwest, and southeast subregions formed by the point.

Here is how points A(4,4), B(8,9), C(2,2), D(6,6), E(10,-1), and F(11,2) are added to an initially empty point quadtree:
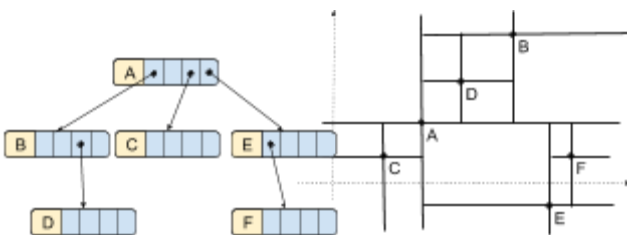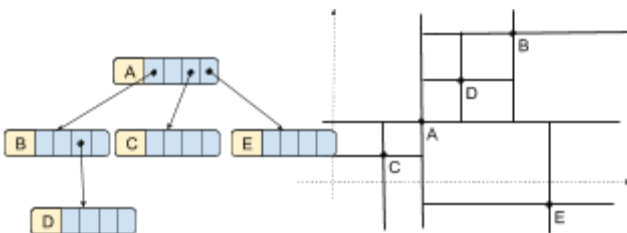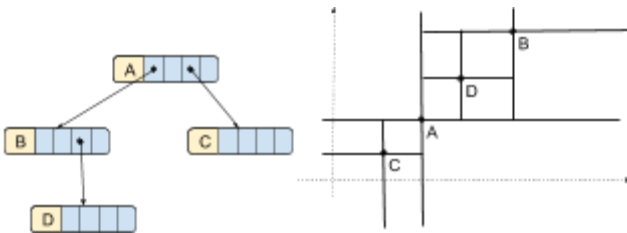
More precisely, point P's northeast subregion contains points whose x and y coordinates are both larger the P's; the northwest subregion contains points whose x coordinate is less than or equal to P's and whose y coordinate is larger than P's; and so on. Here's a diagram covering these boundary cases:
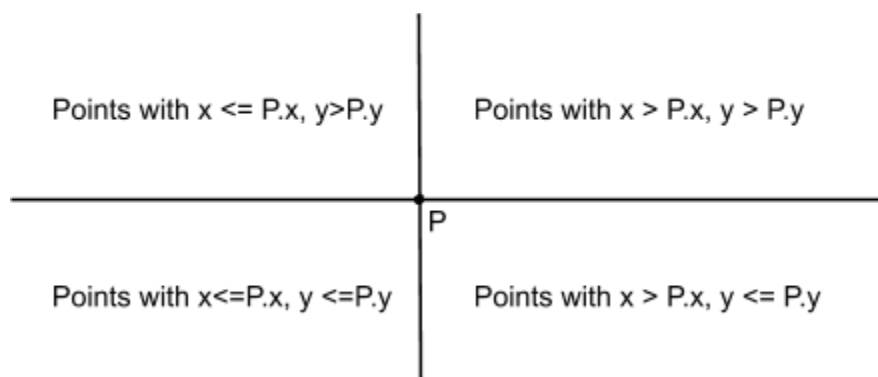
Consider point G(10,1). Start at the root of the quadtree. Point G is in point A's southeast subregion, so follow A's fourth pointer to point E. Compare G to point E's subregions. G is in E's northwest region, so it becomes E's 2nd child. Here's what the tree and geometry look like:

10. QuadTree
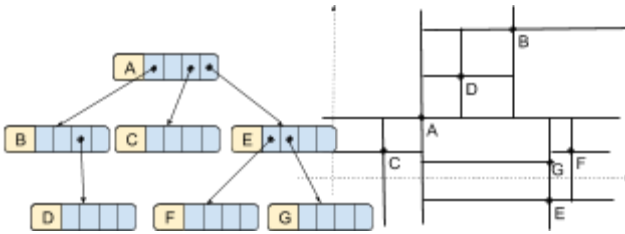
INPUT: 10 sets of data. Each set consists of an integer *K*, an integer *N*, followed by *N* unique points. All points will have integer coordinates. Ignore all whitespace (spaces, tabs, newlines) in the input.

OUTPUT: For each set of data, build a *point quadtree* tree with the *N* points. Then, find the node of the Kth point (*K* will be an integer between 1 and *N*). Print that node's four children, from left to right, with no spaces. If any child is empty, print a 0.

For example, in the tree above, the children of point A would be 2035, representing B (the 2nd point), no child, C (the 3rd point), and E (the 5th point). The children of E would be 6700.

SAMPLE INPUT (*3 sets of data; your test data will have 10 sets of data*)**:**
```
1 7 4 4 8 9 2 2 6 6 10 -1 11 2 10 1
2 7 8 9 6 2 3 5 8 2 7 2 6 6 2 2
9 15
4 2 8 5 10 -3 6 -7 5 -6 6 3 -5 -7 8 -4 0 -2 2 1 7 -11 -10 -9 1 0 -3 -5 -1 1
```

SAMPLE OUTPUT:
1. 2035
2. 0374
3. 1015140

TEST DATA

TEST INPUT: *Each set of input data is shown below*

Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Set 9	Set 10	
2	2	4	5	1	14	16	14	8	5	92 36
8	7	12	9	13	18	26	26	26	50	54 80
5 -3	6 -7	1 3	-11 -20	0 0	0 0	70 10	35 86	26 4	51 36	33 36
7 2	3 2	5 7	-15 -12	-5 -5	7 9	57 56	23 86	22 24	31 80	30 56
9 -1	8 -5	9 13	-7 -8	-1 -1	4 -7	94 29	55 60	26 6	51 81	86 35
6 10	-9 -8	-1 -3	2 5	-3 -3	3 5	68 15	67 36	14 24	30 80	6 95
-4 6	-3 -4	-5 -7	-3 0	-7 -7	-6 -10	31 79	19 2	15 6	23 81	31 95
2 -3	12 2	-9 -13	4 7	3 3	8 -10	23 45	67 15	40 24	30 81	86 95
11 1	-6 7	1 -3	-5 -3	1 1	-6 8	16 36	29 15	14 6	6 80	86 80
-5 -7		-1 3	0 0	7 7	4 6	54 9	30 33	36 6	33 81	86 36
		-3 -5	-7 10	5 5	-8 -12	49 34	89 2	36 4	31 56	23 56
		3 5		-2 2	-4 -8	72 53	29 1	15 12	92 11	30 18
		7 -11		-6 6	-3 10	82 95	89 95	14 4	55 81	31 60
		-7 9		6 -6	10 -15	96 70	40 34	40 4	6 11	92 56
				2 -2	-2 -15	13 59	29 36	36 12	33 11	92 80
					-8 -2	27 58	55 15	15 4	23 29	55 56
					-7 -1	78 42	67 33	26 24	31 18	54 18
					-1 -20	30 86	55 86	22 7	51 60	55 60
					-5 -1	25 87	40 36	14 12	55 11	23 80
					-10 -1	97 51	35 34	36 7	55 95	54 35
						65 20	35 60	36 42	51 11	86 29
						1 84	30 2	40 7	86 11	54 81
						99 93	30 81	15 7	86 56	54 56
						95 5	55 1	36 24	51 95	6 36
						33 40	47 34	15 42	30 29	
						55 71	89 34	22 42	54 36	
						44 77	35 36	26 12	92 18	
						14 94	29 34	22 12	6 35	

Continued at the top of the next column..

TEST OUTPUT:

1. 0403

2. 0750

3. 0857

4. 0078

5. 610212

6. 151800

7. 017200

8. 023220

9. 201300

10. 333206