Overview: You will write a program which reads as its input a list of $N$ points in the plane, where each point is specified by integer $x$ and $y$ coordinates. Your program should output a list of all (axis-aligned) squares having all four corners in the input.

Getting Started: As in the previous homework, you should already have a ~/cs171/ directory. This assignment is named “hw2”, and you should copy the assignment files to ~/cs171/hw2 as follows:

```bash
  cd /home/cs171000/share/hw2
  make copy
  cd ~/cs171/hw2
```

Again there is a `Makefile` defining some useful “make” commands:

```bash
  make run   try to compile and run your program
  make turnin try to turnin your program
  make help   list all the commands defined by Makefile
```

Requirements: You will write a single-file program `Squares.java`. Your program should compile and run correctly in the “make run” test mentioned above. Your program should emulate the I/O behavior of `Brute.java`, which reads $N$ points from its standard input, and the prints out all found squares to its standard output (in some order, you do not need to find the squares in the same order). Your program should be much faster than the naive $O(N^4)$ approach of `Brute.java`, which looks at all 4-tuples of input points. In particular your program will be timed on inputs generated by the generator (`java PointGenerator N`), for $N$ up to at least 500, possibly 1000 (where `Brute.java` takes much too long).

We have the usual honor requirements and late-penalty, as stated on the first homework handout.

Grading: You must successfully “make turnin” to get a non-zero grade. For full credit on this assignment, you should have: (1) correct output of the squares in some order, (2) at least the median running time, and (3) work finished on time.