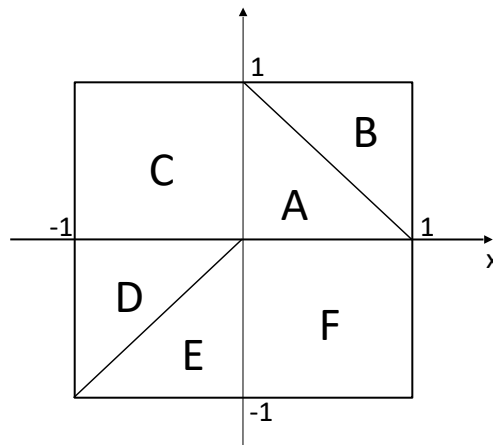# DART GAME

You are given a square dart board as shown below. Assume that we are throwing darts to hit this board. All darts hit the board, at any random coordinate (x,y).

Write a complete Java program that simulates this dart game. Read the number of darts to be thrown from the user (from the keyboard). Randomly generate the target coordinates of the darts on the board (by generating a random number that is valid inside the board. Check the boarders of the dart area). Display their coordinates and the region of target.

Lastly, display the statistics of the number and percentage of dart hits for each region. If the dart falls on a boundary between the regions, consider its region as undecided.

Dart's target coordinate and region matching rules are as follows:

If the randomly generated target coordinate is x = 0.2 and y = -0.5, the dart hits the region F (where x coordinate is positive and y coordinate is negative).

If the randomly generated target coordinate is x = -0.5 and y = 0.7, the dart hits the region C (where x coordinate is negative and y coordinate is positive).

If the randomly generated target coordinate is x = 0.4 and y = 0.3, the dart hits the region A (where x and y coordinates are both positive and x+y is smaller than 1).

If the randomly generated target coordinate is x = 0.4 and y = 0.7, the dart hits the region B (where x and y coordinates are both positive and x+y is bigger than 1).

The line equation x+y = 1 is the line between region A and region B.

If the randomly generated target coordinate is x = -0.5 and y = -0.4, the dart hits the region D (where x and y coordinates are both negative and x is smaller than y).

If the randomly generated target coordinate is x = -0.4 and y = -0.5, the dart hits the region E (where x and y coordinates are both negative and x is bigger than y).

The line equation x=y is the line between region D and region E.
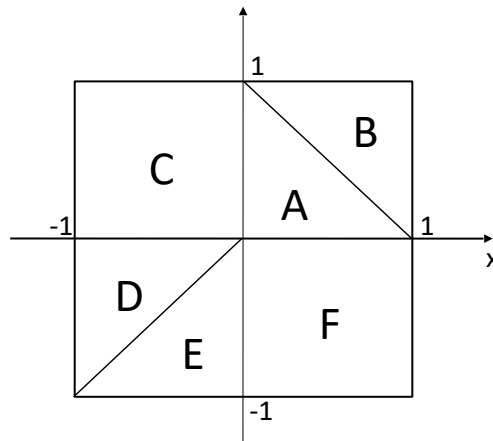
<u>Sample run 1:</u>

DART GAME!
Enter the number of darts to be thrown: 5

Dart 1:
Coordinates: (0.2, 0.1)
Region: A

Dart 2:
Coordinates: (0.7, -0.2)
Region: F

Dart 3:
Coordinates: (0.1, -0.8)
Region: F

Dart 4:
Coordinates: (-0.1, -0.1)
Region: Undecided

Dart 5:
Coordinates: (-0.9, 0.6)
Region: C

Region statistics:
A: 1 dart (20.0%)
B: 0 darts (0.0%)
C: 1 dart (20.0%)
D: 0 darts (0.0%)
E: 0 darts (0.0%)
F: 2 darts (40.0%)
Undecided: 1 dart (20.0%)

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<u>Hints:</u>

-Step 1: First create only one coordinate (x,y)

   -Create a random x and a random y

   -Each coordinate has only one digit after decimal point (i.e. (0.2,-0.5))

-Step 2: Find at which region do you hit the dart board with this coordinate by checking the coordinate-region matching ru

-Identify which statements you need to repeat to throw N darts. N (number of darts to be thrown is given by the user)

-Surround those statements with a loop

-Find loop continuation condition

-Count number of dart hits for each region

Sample run 2:

DART GAME!
Enter the number of darts to be thrown:
1000

Dart 1:
Coordinates: (0.6, -0.6)
Region: F

Dart 2:
Coordinates: (-0.9, -0.1)
Region: D

Dart 3:
Coordinates: (-0.5, 0.3)
Region: C

....

Dart 1000:
Coordinates: (0.8, 0.9)
Region: B

Region statistics:
A: 115 darts (11.5%)
B: 120 darts (12.0%)
C: 248 darts (24.8%)
D: 131 darts (13.1%)
E: 122 darts (12.2%)
F: 262 darts (26.2%)
Undecided: 2 darts (0.2%)

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