Task - EtchASketch Class

Your task is to design and build a class called EtchASketch. This class will model a EtchASketch in several ways. Each EtchASketch should have a serial number. Serial numbers should start at 1 and increase.

Background on EtchASketch

According to [Wikipedia (Links to an external site.)](http://en.wikipedia.org/wiki/Etch_A_Sketch)…

Etch-A-Sketch

Etch A Sketch is a mechanical drawing toy invented by André Cassagnes of France and subsequently manufactured by the Ohio Art Company.

An Etch A Sketch has a thick, flat gray screen in a red plastic frame. There are two knobs on the front of the frame in the lower corners. Twisting the knobs moves a stylus that displaces aluminum powder on the back of the screen, leaving a solid line. The knobs create lineographic images. The left control moves the stylus horizontally, and the right one moves it vertically.

For simplicity, the Etch-A-Sketch’s display surface will be considered to be 7 inches wide and 5 inches tall. The left knob moves the stylus in the horizontal (clockwise is to right) and the right knob moves the stylus in the vertical (clockwise is up). One can [learn to draw pictures (Links to an external site.)](http://www.wikihow.com/Master-the-Etch-a-Sketch) with the device. Assume that a 360 degree turn of the knob moves the corresponding axis of the stylus by .5 inches. It is *not* possible to move the stylus beyond the display area.

EtchASketch Characteristics

* (All) Constructors: serial number and initial x,y = 0,0
* Queries:
  + double getY() - present Y position of stylus in
  + double getX() - present X position of stylus
  + boolean isClear() - return true if nothing on Etch-A-Sketch
  + double distance() - return distance traveled by stylus since last erase
  + String toString() - return “<serialNumber>, <x-pos>, <y-pos>, <clear?>”  
    Don’t show the < or >.
* Commands:
  + void leftKnobTwist(double degrees) - number of (signed) degrees to twist left knob linearly in next second
  + void rightKnobTwist(double degrees) - number of (signed) degrees to twist right knob linearly in next second
  + void bothKnobsTwist(double leftDegrees, double rightDegrees) - number of (signed) degrees to twist both knobs linearly in next second
  + void erase - clear Etch-A-Sketch screen (any movement causes screen to be ‘non-clear’)

Figure 2. EtchASketch UML Class Diagram

TestEtchASketch

Design and build a class that will have a public main() method which will run several tests to exercise the Etch-A-Sketch class. The tests should exercise each query and command. Remember, tests should both exercise functionality and grade the response. Include the output of the run of this program and include a results.txt (or results.doc, results.odt, results.pdf) file that reviews the results of tests that demonstrates that the author has shown the program’s quality.

Remember that one can use

java TestEtchASketch > sample\_run.txt

to capture the standard out output of the program into a file (in this case named sample\_run.txt).

Obey Java Documentation Style

Continue to use the specified [documentation standard for Java source code (Links to an external site.)](http://www-ece.eng.uab.edu/DGreen/java_ex/JavaDocStyle.html).

Discussion/Questions

A [discussion forum](https://uab.instructure.com/courses/1265360/discussion_topics/6039003) is available for discussion and questions.

Delivery

You shall produce source code that complies with the documentation standards. Your program MUST show your name and BlazerID near the top of the listing and display out your name and BlazerID at the start of the test run. Produce a blazerid-p2.zip file that contains a copy of the NetBeans Project folder for the assignment and submit it using the assignment tool of Canvas by class time of the due date (or if you attend class and sign the class roll for the day, you can automatically have an extension to 11:59pm of the same day.) Be sure that your results file and the corresponding demo files are also included in the .zip file.

The programmette will be graded by the rubric given below.