Mini Project # 1
Date Assigned: 23/10/2008
Due Date: 11/11/2008 – 14/11/2008

Problem 1: Snowflake
Construct Koch's snowflake using recursion similar to the following diagrams. Test your program properly.

Koch Snowflake: [R1]
The Koch snowflake (or Koch star) is mathematical curve and one of the earliest fractal curves to have been described. It appeared in 1904 paper entitled "On a continuous curve without tangents constructible from elementary geometry" by the Swedish mathematician Helge von Koch. The lesser known Koch curve is the same as the snowflake, except it starts with a line segment instead of an equilateral triangle.

One can imagine that it was created by starting with a line segment, then recursively altering each line segment as follows:
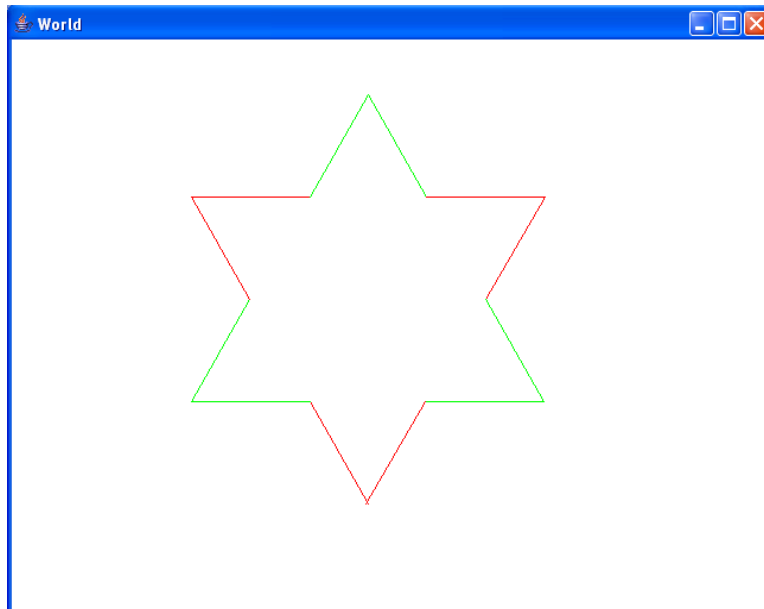
1. Divide the line segment into three line segments of equal length.
2. Draw an equilateral triangle that has the middle segment from step 1 as its base.
3. Remove the line segment that is the base of the triangle from step 2.

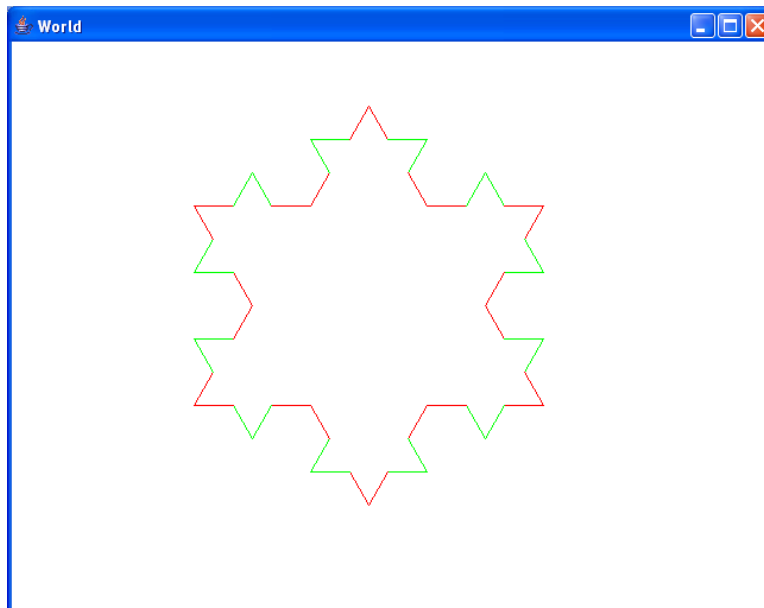**Diagrams of first four Levels of Koch's Snowflake:**
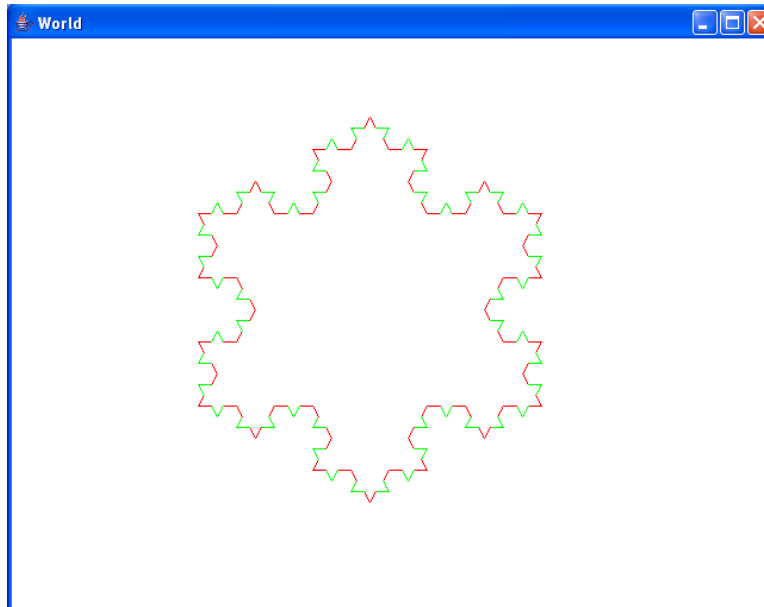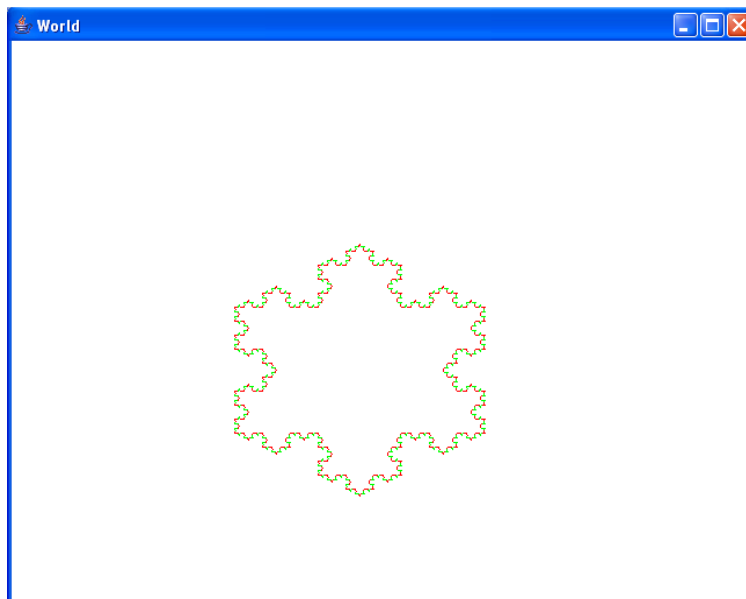
Output with Level 0:
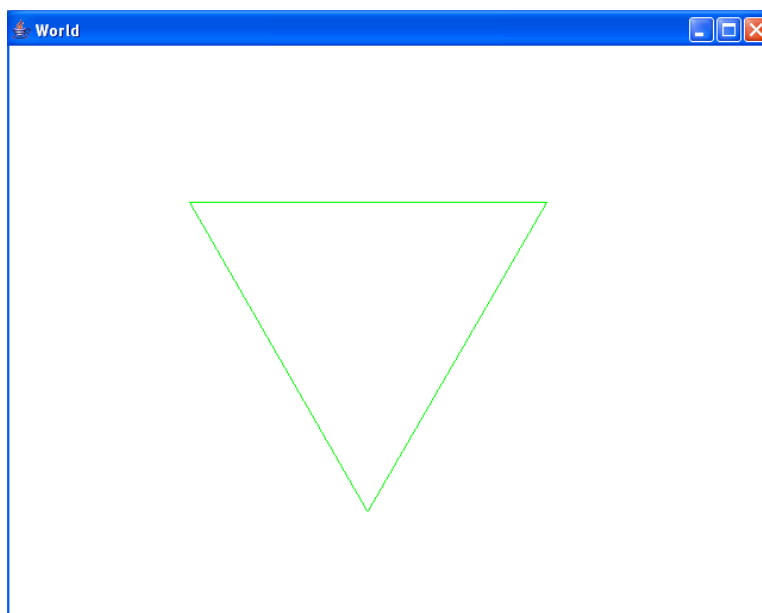
Output with Level 1:

Output with Level 2:

Output with Level 3:


Output with Level 4:

Problem 2: Turtle Random walk without intersections (Modified as explained in class)
Suppose that you leave the turtle in the middle of a large city whose streets form a familiar pattern. We assume that there are N north-south streets and N east-west streets all regularly spaced and fully intersecting in a pattern known as a lattice. Trying to escape the city, the turtle makes a random choice of which way to go at each intersection, but knows by scent to avoid visiting any place previously visited. But it is possible for the turtle to stick at a dead end where there is no choice but to revisit some

interactions so in that case the program gives a message that turtle is stuck and then asks to terminate or proceed from beginning. Test the output of the program properly. Following are the output windows which can help you further understanding of this problem:

Sample Outputs with Dialog box 400x400 and Single Turtle Step equals to 20 pixels:
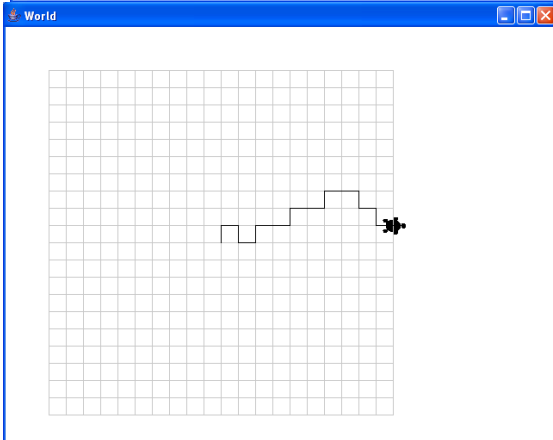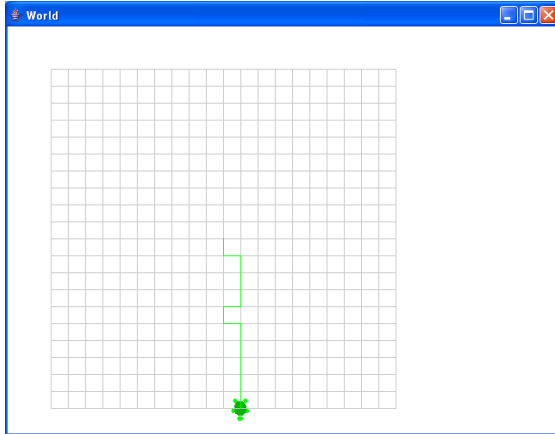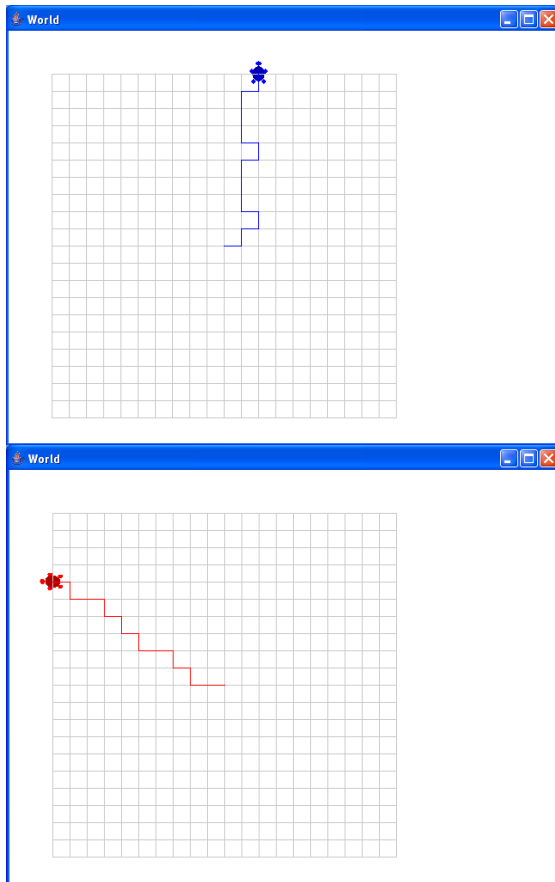
Hint:

You have to construct the grid using the dimensions of the dialog box and take an offset that that equally divides the grid. For instance, the above screen shots are developed using:

Dialog box:
400 x 400 pixels.
Single turtle step (offset) =20 pixels (As, 400/20=20)
Total grid squares: 20 x 20 (As, 400/20=20)

Design Information and Requirements

- Use turtle world classes in both problems
- Use parameter passing properly.
- The code should be well indented and easy to read.
- Follow naming convention discussed in the session for naming classes, variables, function and constants.
- No project submissions are accepted after due date.

- Maximum two persons are allowed in one project group. But both must be from the same class group(G1/G2)
- Don't use any concept that you didn't study in the course yet.
- Avoid plagiarism, negative marking will be conducted in case of plagiarism.
- Every one's Project will be evaluated in respective lab sessions after due date. Both project members will be evaluated equally.

Project Grading Scheme	
Item	**Marks**
Look and Feel	15%
Code Quality	40%
Code Testing	30%
Complete Execution	15%

Reference:

R1:http://en.wikipedia.org/wiki/Koch_snowflake