Mathematics Assignment #1

Create a simple L-System model

Date: Thursday 27th November 2011
Due Date: Thursday 2nd December 2011

Create a simple L-System model

The objective of this assignment is to implement a simple model of an L-System based on the work by Aristid Lindenmayers.

This is a single person project.

Technical Specification

1. Your implementation need not run in real-time.
2. Your implementation can be rendered using ONLY lines.
3. The implementation will be based on the supplied DirectX framework RTVS_Lite.

Required functionality

Basic requirements:

1. Read a configuration file containing L-System parameters.
2. Display the resulting L-System model such that using Hotkeys successive iterations can be manually stepped through.

Additional requirements:

3. Hotkey the read configuration file process such that different hotkey can load and display at least four different configuration files.
4. Hotkey the increment/decrement of at least three of the L-System parameters which are then used to recreate the L-System model.

Software requirements

1. It will be implemented in C++ using the supplied DirectX framework RTVS_Lite.
2. Your project should be created in Microsoft Visual Studio 2008 or 2010.
3. There must be a clear distinction between your application framework and your application (i.e. between those parts of your application that provide 'housekeeping', and those that implement your L-System).
4. You must include a complete working example in your submission (see below).
5. You must provide all dependent files (see below)
6. You must ensure that the Lecturer can compile and run your application on the Lecturer's PC.

Delivery and Marking

There are five parts worth 10, 40, 20, 10 and 20 marks respectively:

1. Read a configuration file containing L-System parameters (10).
2. Display the resulting L-System model such that using Hotkeys successive iterations can be manually stepped through (40).
3. Hotkey the read configuration file process such that different hotkey can load and display at least four different configuration files (20)
4. Hotkey the increment/decrement of at least three of the L-System parameters which are then used to recreate the L-System model (10).
5. Write an illustrated description (name it "*lsystem.doc*" and it must be 1200 words or more) of your project detailing your objectives, data classes and other structures (20).

Please note that the marks awarded will not depend solely on satisfying the implementation requirements detailed above, but also on the elegance of your solution, the techniques used, the speed of your application, quality of code documentation and the quality of the images realised.

Please also note that your implementation should be able to render the L-Systems illustrated below.

Submission requirements

When you have completed your assignment, make a copy of your project and the written description of your project, other project files, output images and other associated files in to a directory called *lsystemproject* in your home directory. Zip this file.

Write a short *README.txt* plain text file, describing what (and why) you have included within your *lsystemproject* project folder.

Upload the *lsystemproject.zip* and the *README.txt* file to your assignment area.

Example of typical line based L-Systems

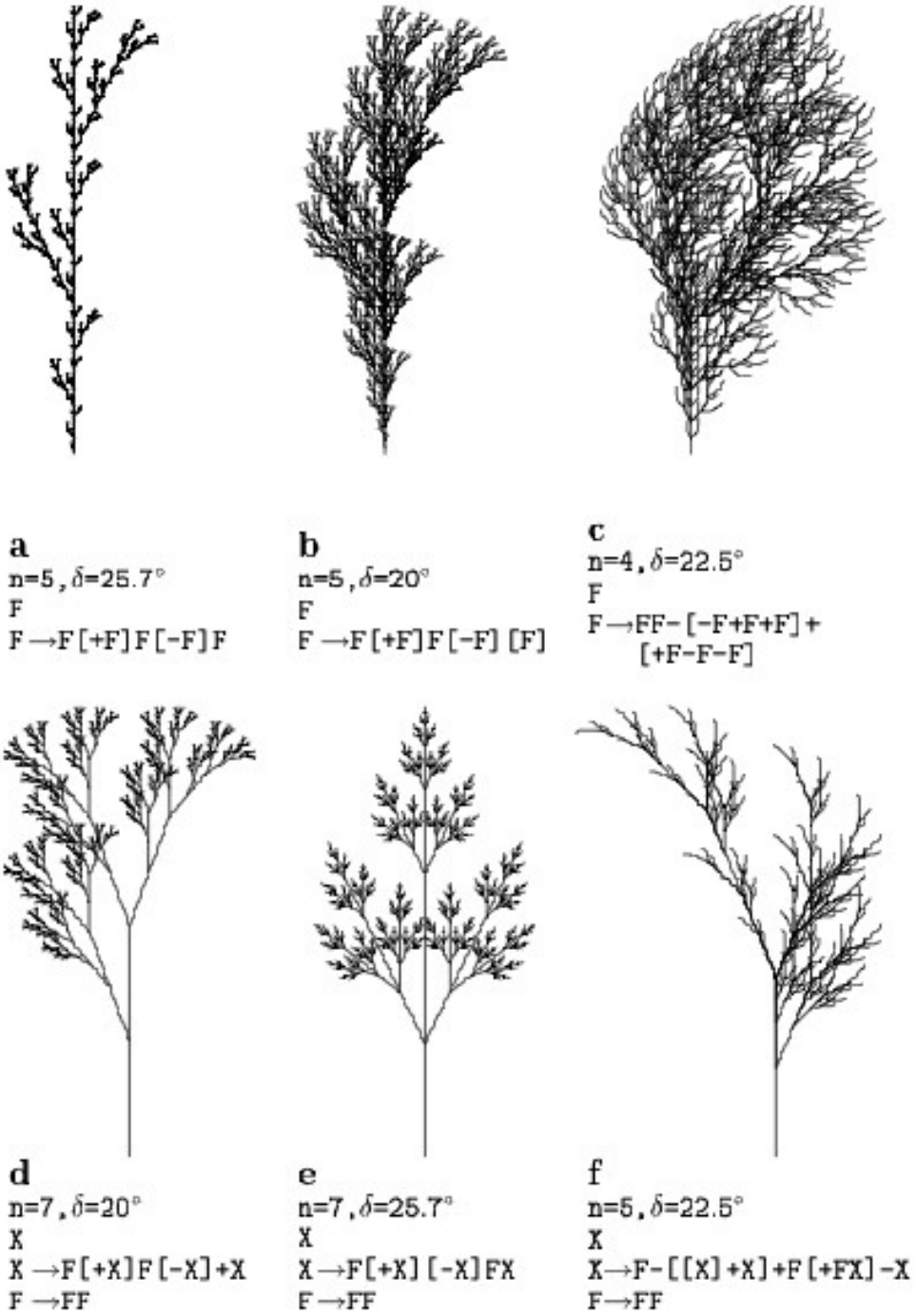

Figure 1.24: Examples of plant-like structures generated by bracketed OL-systems. L-systems (a), (b) and (c) are edge-rewriting, while (d), (e) and (f) are node-rewriting.