

# University of Calgary CPSC453 Assignment 1 Fractals

Wednesday September 17, 2003

**Due Date: Sunday October 5th at 11:59 pm**

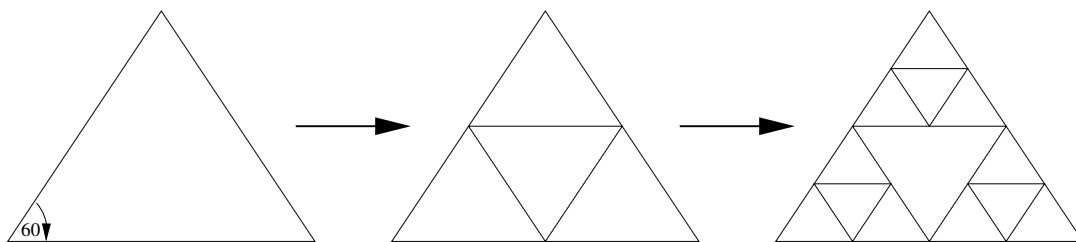
Total Marks: 100

## General Specification of the Assignment

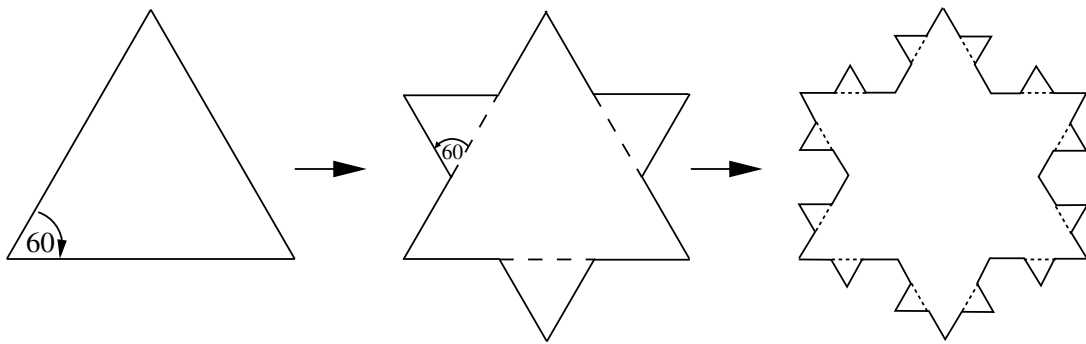
In this assignment you will be writing a program that produces the following fractals. Not all fractals will have the same solution or even implementation. You are encouraged to design a solution for each fractal on paper and then implement it on the computer. You will be marked on both implementation and documentation according to the grades appearing beside each fractal.

**Note:** The dashed lines indicate the previous state of each fractal

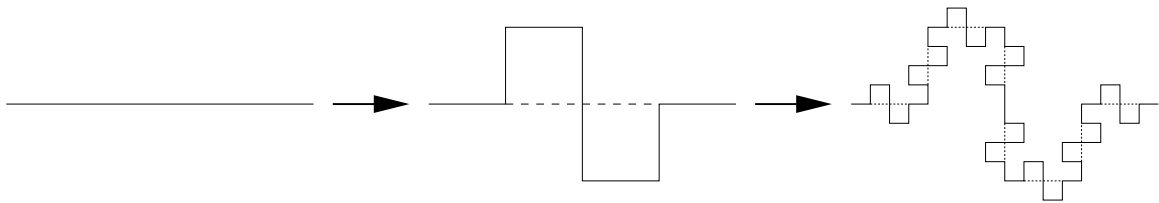
### Sierpinski Triangle (10 Code, 5 Documentation)



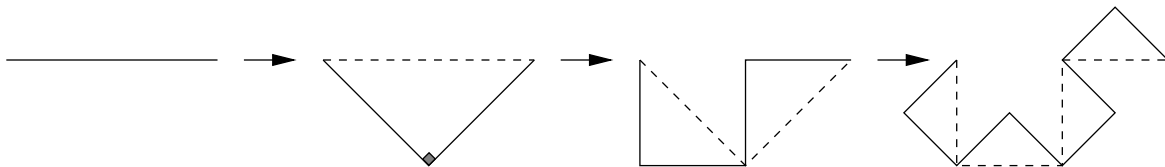
**Koch Snowflake (10 Code, 5 Documentation)**



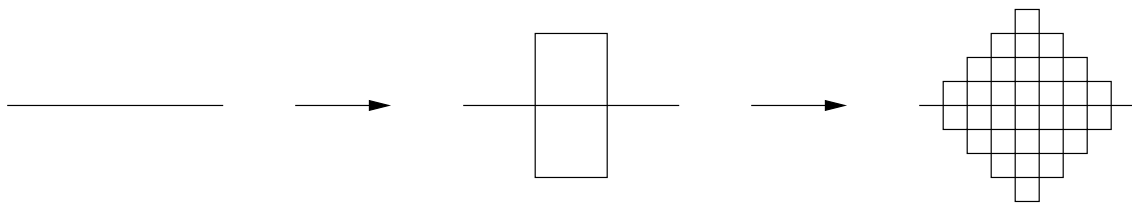
**Quadratic Koch (13 Code, 7 Documentation)**



**Dragon (15 Code, 10 Documentation)**



**Peano's Space Filling Curve (15 Code, 10 Documentation)**



# Non-functional Requirements

## Documentation

1. You must provide a **README.pdf** file in Adobe PDF format. Non-standard file formats, such as plain ASCII text (.txt) or Microsoft Word (.doc) are not acceptable. 2. Your README.pdf file should contain:
  - (a) Your **name** and **student number**
  - (b) Solution to each fractal generation
  - (c) A brief description of the **data-structures** you used to implement the assignment
  - (d) Any **design decisions** you had to make (in cases where the assignment specification was ambiguous)

## Source Code

1. All your source code must be written in **C** and/or **C++**. All graphics rendering must be done using **OpenGL**. All event handling and windowing must be performed via **QT**. Your source code must compile on the lab machines without any special modifications (code that doesn't compile receives a zero). Your source code must be clear and well commented.
2. Your data-structure should not be limiting in any way. You will lose marks for inefficient and slow implementations.
3. You may **reuse source code**:
  - (a) which has been provided by the instructor for use in the course,
  - (b) which has been written by you which implements basic data structures, such as linked lists or arrays,
  - (c) which you have received permission from the instructor or one of the TAs of CPSC 453 prior to handing-in your assignment,
  - (d) none other.
4. Any instances of **code reuse** by you for this assignment must be explicitly mentioned within the README.pdf file. Failure to do so will result in a zero in the source code part of the assignment. Please read the University of Calgary regulations regarding **plagiarism** [[http://www.ucalgary.ca/pubs/calendar/current/How/HOW\\_LB.htm](http://www.ucalgary.ca/pubs/calendar/current/How/HOW_LB.htm)]
5. All source code and the README.pdf file must be **electronically handed-in**.

# Functional Requirements

## Windows

1. Your program should open with a blank window. The position and size of the window are not important, as long as all of the window can be seen comfortably.

## Interaction

1. Users should have a way of selecting which fractal they would like to see. Having a pull-down menu is helpful.
2. Your program should allow the user to somehow step through fractal generations.
3. Users should be allowed to select how many iterations they want the fractal to be generated.
4. Your program should provide necessary feedback to the user.
5. Users should be able to zoom in and out of a fractal.

## Display

1. Fractals should be rendered in attractive colours. A fractal may not have a single colour.
2. Fractals should be generated in a reasonable amount of time.
3. During the time a fractal is being generated, a progress bar should be shown.

## Presentation

- You are required to give an approximately 5 minute live demo to your TA, a schedule will be posted and you can sign up for a time slot.
- It is your responsibility to arrange for a presentation with your TA. Failure to show up at the presentation will result in a zero in the assignment.