BIS 420 PROGRAMMING FOR DATA SCIENCE

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CHAPTER 5 EXERCISE 5.5

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Read the following function and see if you can figure out what it does. Then run it

(see the examples in Chapter 4)

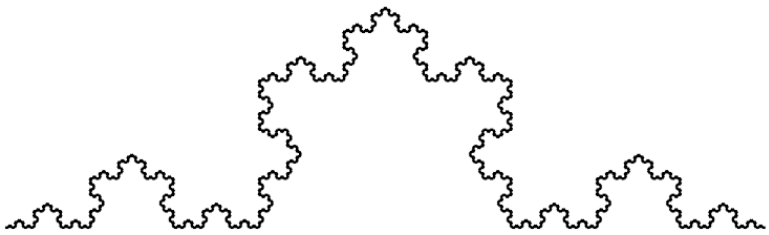

Figure 5.2: A Koch curve.

```
def draw(t, length, n):
if n == 0:
return
angle = 50
fd(t, length*n)
lt(t, angle)
draw(t, length, n-1)
rt(t, 2*angle)
draw(t, length, n-1)
lt(t, angle)
bk(t, length*n)
```

Ans:

```
import turtle

def koch_curve(t, length, n):
    if n == 0:
        t.forward(length)
    else:
        length /= 3.0
        koch_curve(t, length, n - 1)
        t.left(60)
        koch_curve(t, length, n - 1)
        t.right(120)
        koch_curve(t, length, n - 1)
        t.left(60)
        koch_curve(t, length, n - 1)

def draw_koch_curve(order, size):
    screen = turtle.Screen()
    screen.bgcolor("white")

    t = turtle.Turtle()
    t.speed(0)

    t.penup()
    t.goto(-size // 2, 0)
    t.pendown()
```

koch_curve(t, size, order)

screen.mainloop()

draw_koch_curve(4, 300)

```
import turtle

def koch_curve(t, length, n):
    if n == 0:
        t.forward(length)
    else:
        length /= 3.0
        koch_curve(t, length, n - 1)
        t.left(60)
        koch_curve(t, length, n - 1)
        t.right(120)
        koch_curve(t, length, n - 1)
        t.left(60)
        koch_curve(t, length, n - 1)

def draw_koch_curve(order, size):
    screen = turtle.Screen()
    screen.bgcolor("white")

    t = turtle.Turtle()
    t.speed(0)

    t.penup()
    t.goto(-size // 2, 0)
    t.pendown()

    koch_curve(t, size, order)

    screen.mainloop()

draw_koch_curve(4, 300)
```