

Lecture 26

Student Symbol table

2
3

```
1 class Student:
2     def __init__(self, name, year):
3         self.name = name
4         self.year = year
5
6     def getName(self):
7         return self.name
8
9     def getYear(self):
10        return self.year
11
12    def setYear(self, newYear):
13        self.year = newYear
14
```

10
↓
1
4
5)

```
15
16 if __name__ == '__main__':
17     # Symbol table example
18     jane = Student('Jane', 2024)
19     print(jane.getYear())
20     jane.setYear(2023)
```

0)

Main	
<u>Name</u>	<u>Value</u>
Student	<Class>

< Student Class >		
<u>Name</u>	<u>type</u>	<u>Value</u>
--init--	method	
getName	"	
get year	"	
Set year	"	

1) jane = Student('Jane', 2024)

< Student object > jane

<u>Name</u>	<u>Value</u>
--init--	
getName	
get year	
Set year	
Name	'Jane'
year	2024

get year

<u>Name</u>	<u>Value</u>
Self	

jane.getyear()

return self.year
[line 10] return 2024

--init--

<u>Name</u>	<u>Value</u>
Self	
name	'Jane'
year	2024

2) self.name = name 'Jane'

3) self.year = year

line 18 ends

4) Line 19

jane.getYear() $\Rightarrow$ 2024.

getYear table goes away

getYear	
<u>name</u>	<u>value</u>
Self	

5) jane.set Year(2023)

Ma.h

<u>Name</u>	<u>Value</u>
Student	<class>

< Student object > jane

<u>Name</u>	<u>Value</u>
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--init--

getName

get year

Set year

Name

Year

'Jane'

2024

2023

< Student class >

<u>Name</u>	<u>type</u>	<u>Value</u>
-------------	-------------	--------------

--init-- method

getName "

get year "

Set year "

~~Self. Set Year~~

<u>Name</u>	<u>Value</u>
-------------	--------------

~~Self~~

~~new year 2023~~

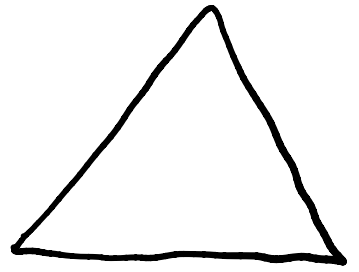
~~Self. year = new year~~

~~Self. year = 2023~~

Lecture 27: L-systems

Koch Snowflake

- Start with **Initial Shape** in mind that turtle will draw:



- Represent initial shape using a String: 'F++F++F']

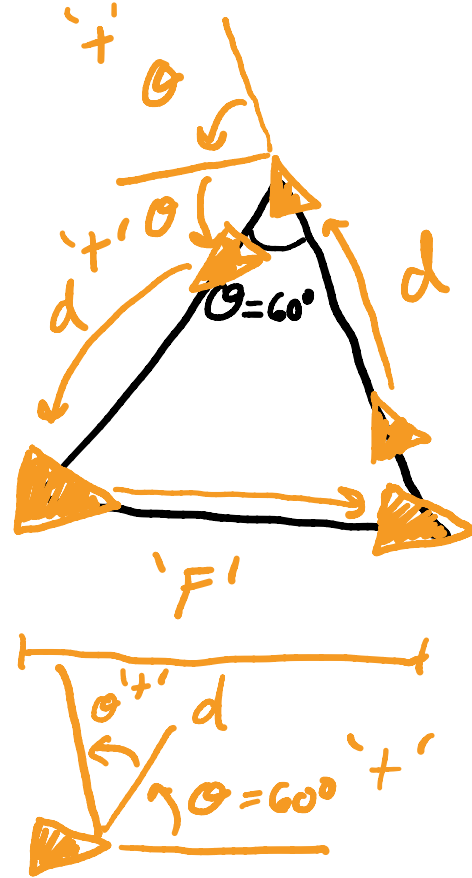
draws initial shape

base string

Each character is interpreted as a Command used to move turtle:

- 'F' means turtle move forward by a **distance d**
- '-' means turtle turn right by an **angle θ** .
- '+' means turtle turn left by an **angle θ** .

Symbols represent **L-system alphabet**



- d Can be anything for Koch Snowflake
 - θ Should be **60°**
- different for different L-systems
- for Koch Snowflake

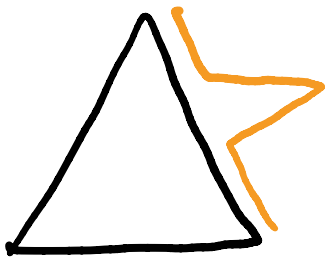
We apply replacement rules some number of times to make the snowflake fractal

Replacement rule composed of:

1) Find string — e.g. 'F' ← every occurrence of this

2) Replace string — e.g. 'F-F++F-F'

'F++F++F'

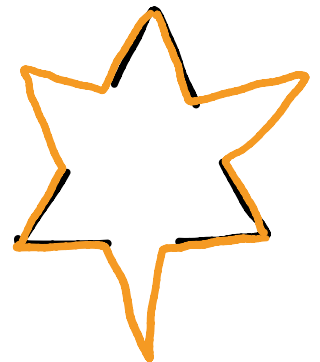
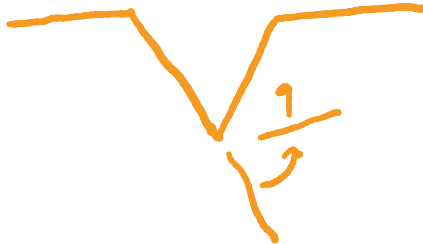


initial
shape

Find:



replace
with:

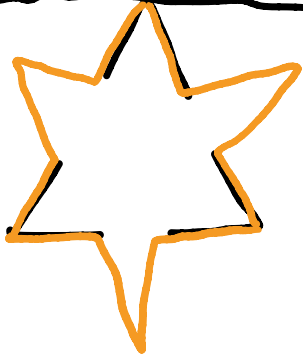


Shape with
replacement rule
applied

Iteration 0: 'F++F++F'] base string

Iteration 1:

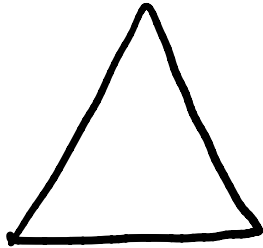
'F-F++F-F' ++ 'F-F++F-F' ++ 'F-F++F-F'



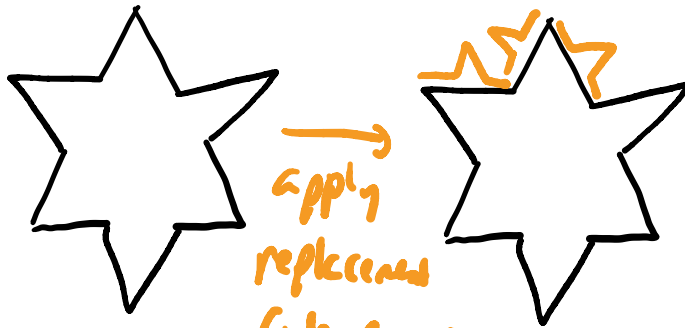
Draws
Star

Pictures

Iteration 0:

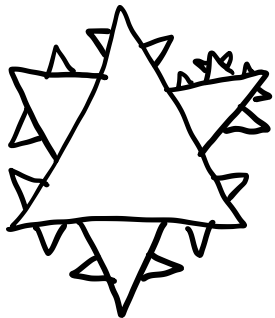


Iteration 1:



apply
replaced
rule again

Iteration 2:



...