

Java Programming AP Edition

U5C14 Recursion

REAL WORLD RECURSIVE PROBLEMS

ERIC Y. CHOU, PH.D.

IEEE SENIOR MEMBER



Mirror in Mirror





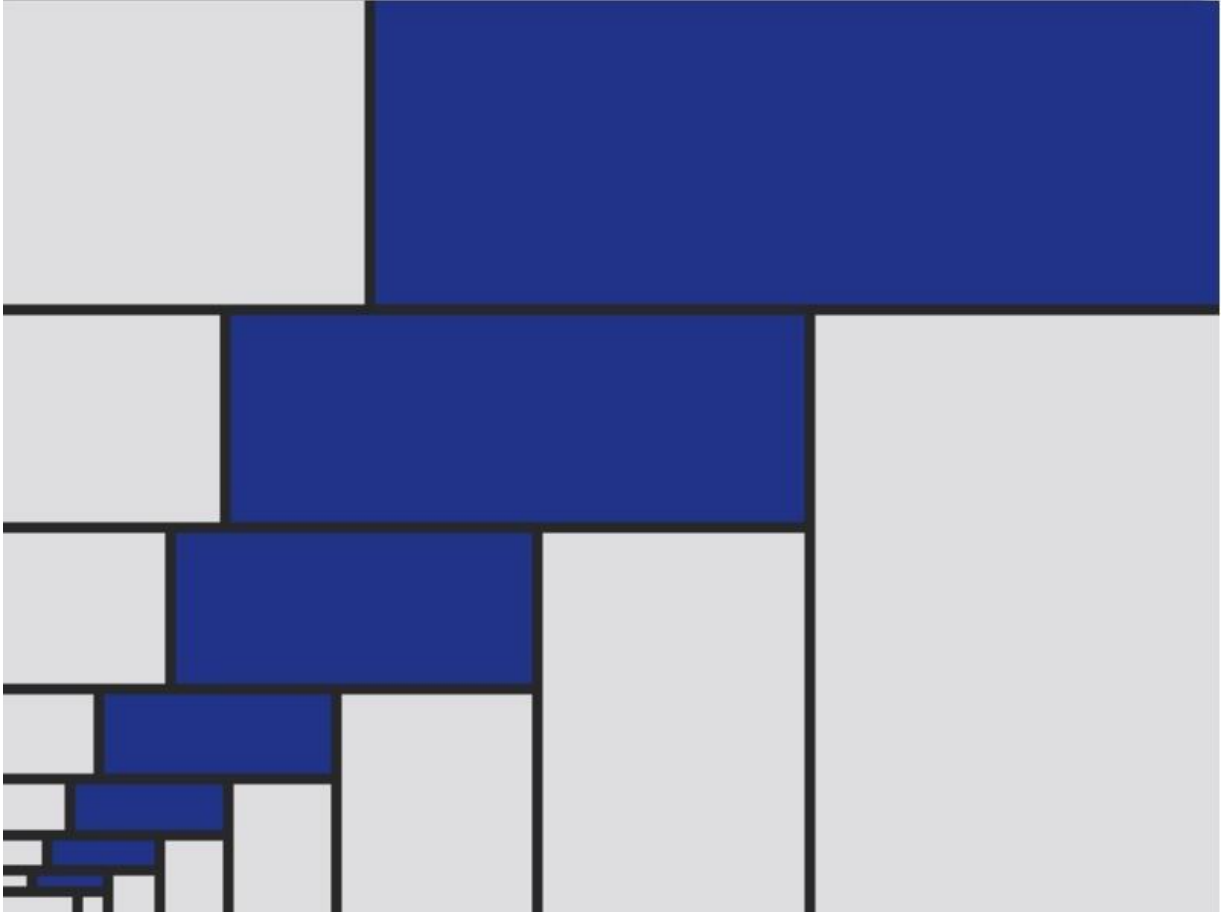
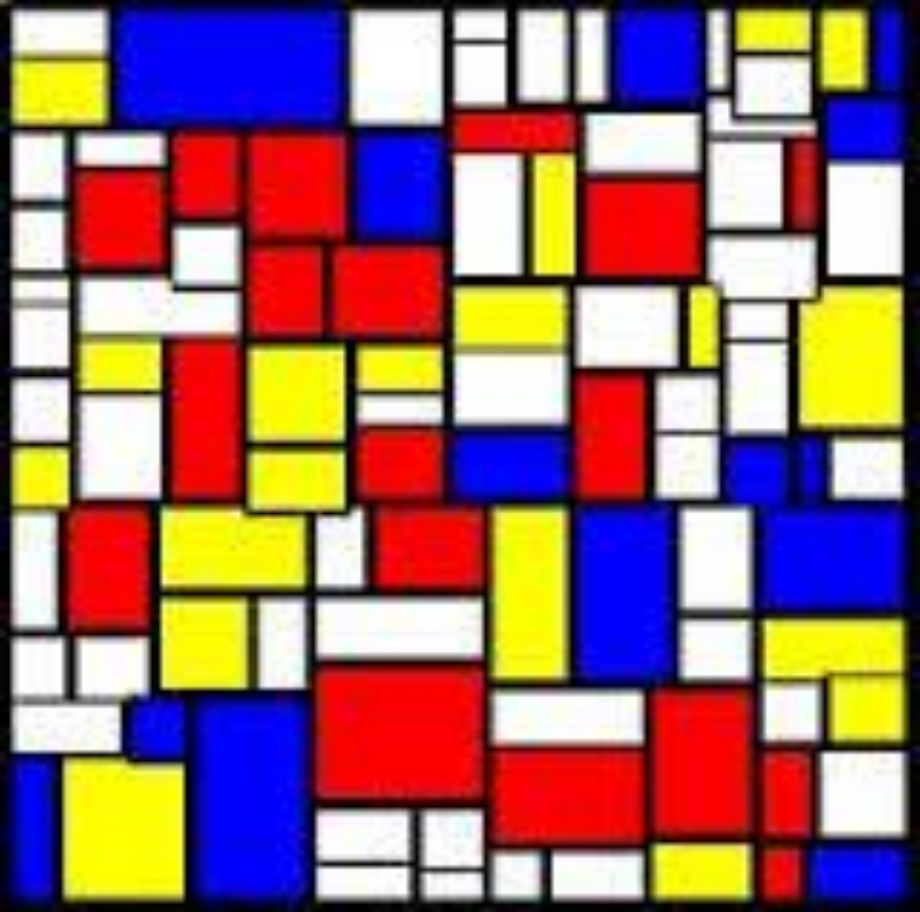
Fractals (Computer Art)





Mondrimat Arts

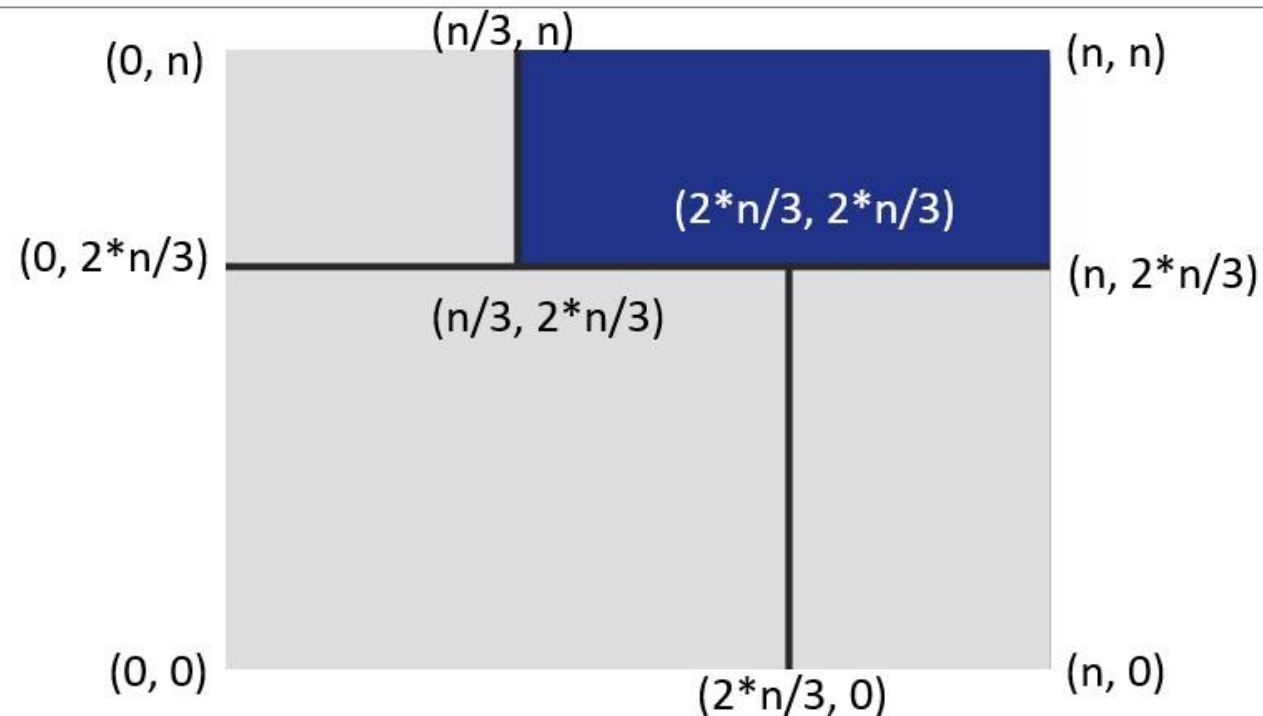
<http://www.tristesse.com/~howie/Flash/MondRect.html>





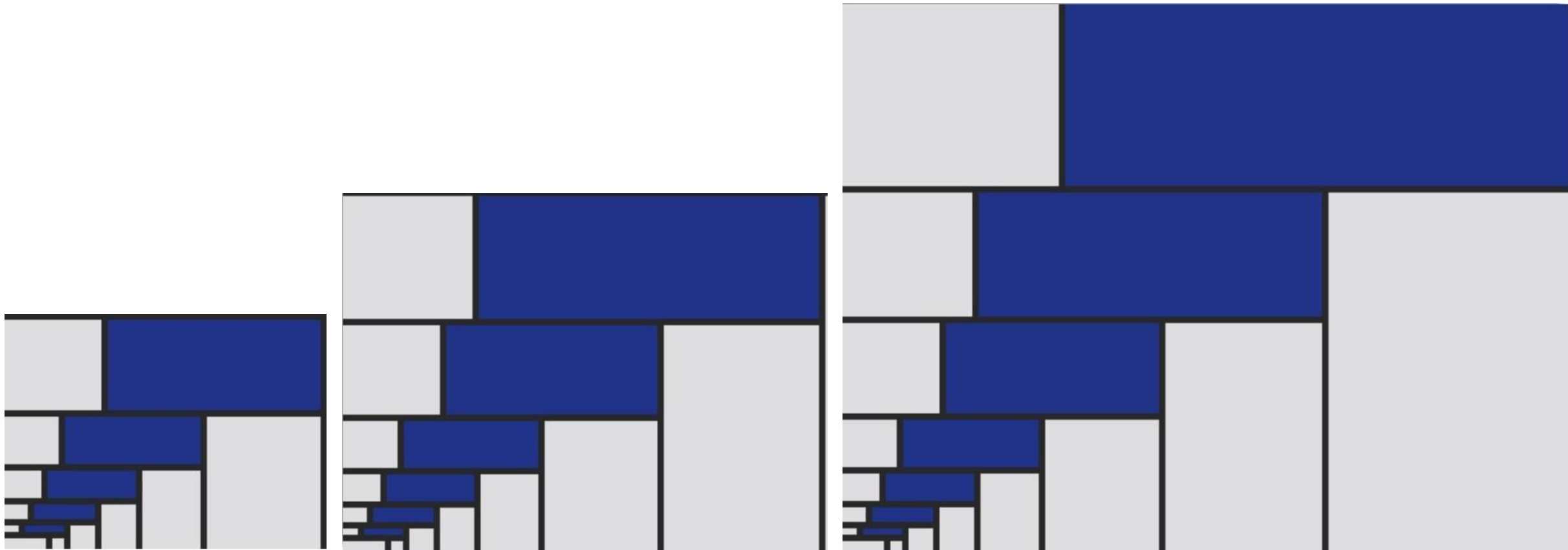
Reading the Recursive Pattern

```
draw(int n) { /* will draw the following pattern  
for one recursion call. */ }
```





Reading the Recursive Pattern





Three Principles in Recursion

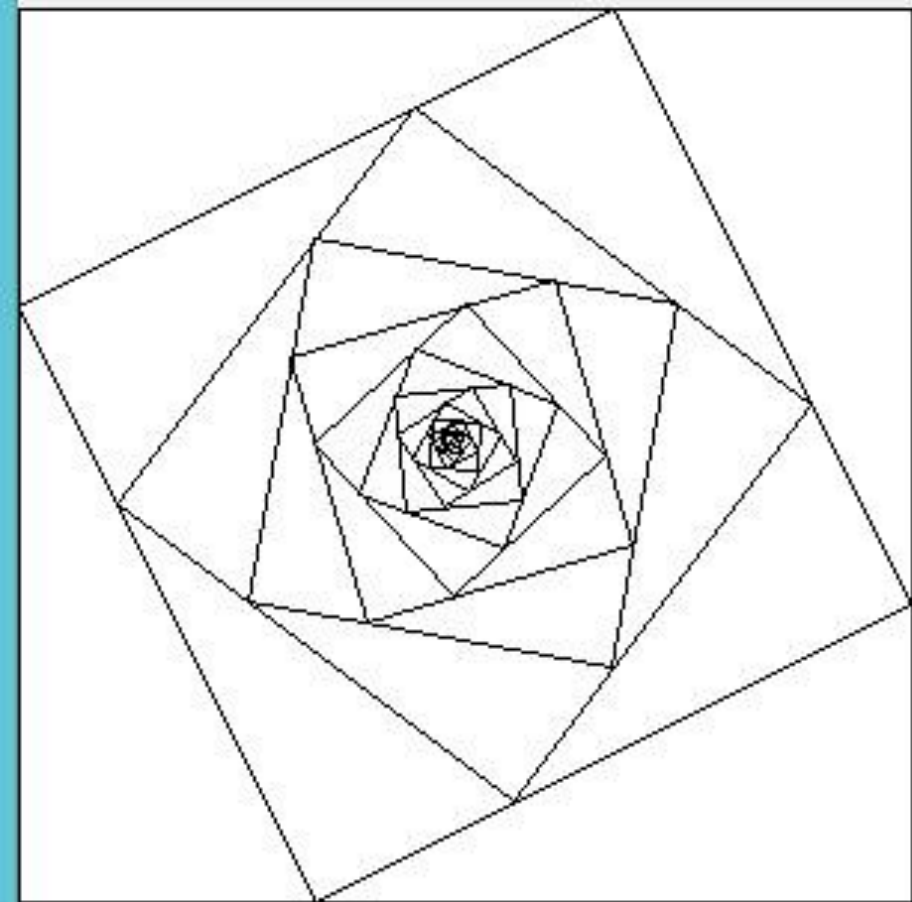
(1) Divide and Conquer

(2) Recursive Function

(3) Stop Condition (Otherwise, it will never stop.)



Demo Program: `<applet>` RecursiveRectangle.java

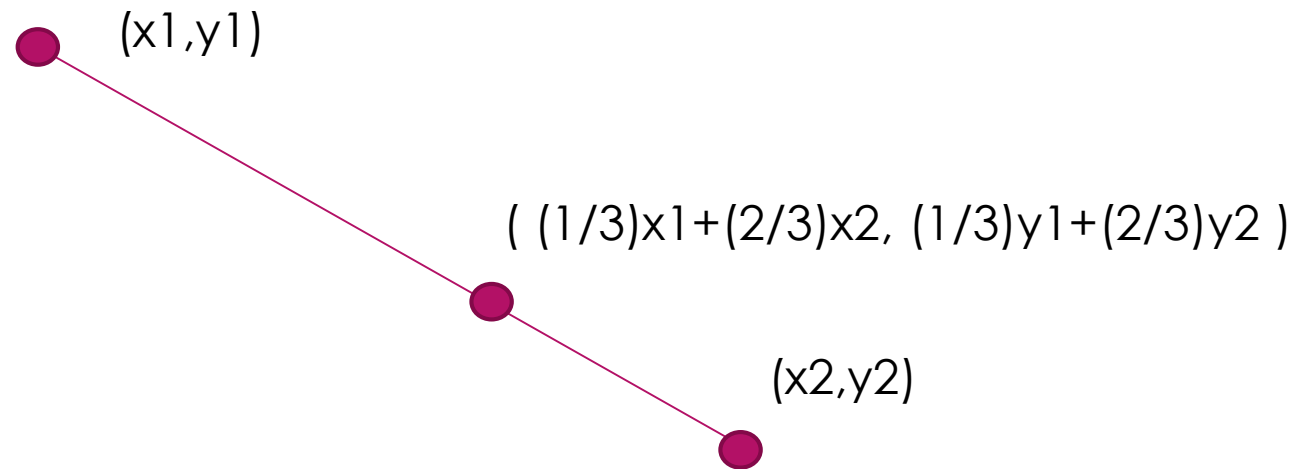


- This recursive rectangle project requires you to draw rectangles recursively on the one-third points of the line segments as shown on the left.
- After finishing a rectangle, you need to draw smaller rectangles based on the one-third points of the previous rectangle's line segments. (Recursion)
- Until the line segment's length is less than square root of ten, which also means the square of the line segment's length is less than 10. Then, you stop the recursion. (Stop Condition)
- Your results should look like the picture on the left side.



Demo Program: RecursiveRectangle.java

Calculation of the one-third point





Demo Program: RecursiveRectangle.java

Go BlueJ!!!