

# Rust Concurrency - Generating the Mandelbrot Set

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# Taken from the Rust Book

Based on the Concurrency section of Chapter 2 (A Tour of Rust)  
from the O'Reilly “Programming Rust” book.

# Introduction

The Mandelbrot set.

Complex numbers and iterating complex numbers.

Generating the Mandelbrot set with one processor.

The required changes to use multiple processors.

# The Mandelbrot set

$$z = a + bi$$

$$z = z^2 + c$$

# Complex numbers and iterating complex numbers

## Addition

$$(a + bi) + (c + di) = (a + c) + (b + d)i$$

## Multiplication

$$\begin{aligned}(a + bi) \times (c + di) &= ac + (ad + bc)i + bdi^2 \\ &= (ac - bd) + (ad + bc)i\end{aligned}$$

Generating the Mandelbrot set with one processor

The required changes to use multiple processors