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From Python to Numpy

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Temporal Vectorization

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Conclusion

Temporal Vectorization

This lesson explains temporal vectorization with an interesting case study called "Mandelbrot set".

We'll cover the following

Problem Description

Temporal vectorization is where elements share the same computation but necessitate a different number of iterations.

Problem Description

The Mandelbrot set is the set of complex numbers c for which the function $f_c(z) = z^2 + c$ does not diverge when iterated from $z = 0$, i.e., for which the sequence $f_c(0), f_c(f_c(0))$, etc., remains bounded in an absolute value. It is very easy to compute, but it can take a very long time because you need to ensure a given number does not diverge. This is generally done by iterating the computation up to a maximum number of iterations, after which, if the number is still within some bounds, it is considered non-divergent.

Of course, the more iterations you do, the more precision you get.



Romanesco broccoli, showing self-similar form approximating a natural fractal. Image by Jon Sullivan, 2004.

In the next lesson, we'll try to solve this case study using the Python approach.

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Coding Example: Reaction-Diffusion

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Coding Example: The Mandelbrot Set (...)

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