

Mandelbrot Area Challenge

Group Blue - Dable Di dable dei



Organization among the Team



How it started ...

Embrace
= THE =
Chaos



**Checking out the
example ...**



**Thinking about the
problem ...**



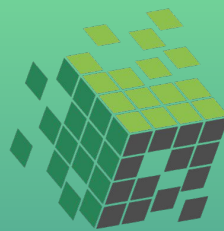
How it was going ...



How it ended ...

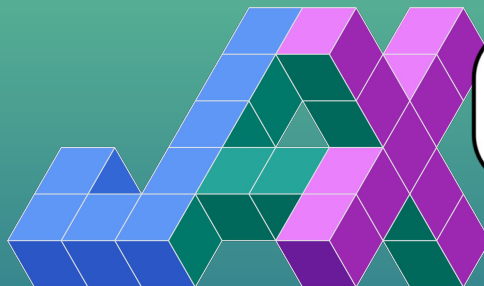


Ansatz



CuPy

I make things slower!



I don't compile!

 Numba

I have CUDA..
but it's tricky

Expectation



Reality



Achievements

- Divide and Conquer
- Make Songs about Mandelbrot

Verse 1

In a room filled with BBQ smoke,
We gather 'round, no need to poke.
The challenge laid, the task at hand,
Mandelbrot set, it's time to command.

But Python, oh you cheeky friend,
Your pace is slow, when will it end?
We tweak and tune, we add some
spice,
But making you fast, oh, it's not quite
nice.

Chorus

Oh, Python, you're a beast we love,
But speed's not from heaven above.
To make you fly, we twist and turn,
But faster speeds, we surely yearn.

Verse 2

We reached for Numba, gave it a try,
With jit and njit, we aimed to fly.
But still, the clock, it's ticking slow,
There's gotta be a faster show.

What next, we ask, with minds
perplexed,
Is it JAX, TensorFlow, or CUDA next?
The BBQ sizzles, the heat's intense,
As we code away in self-defense.

Chorus

Oh, Python, you're a beast we love,
But speed's not from heaven above.
To make you fly, we twist and turn,
But faster speeds, we surely yearn.

Bridge

Should we ditch you for something
lean?
C++ or Rust, the coding machine?
Or maybe just give up the fight,
And run it all on CUDA tonight?

Verse 3

The smell of BBQ fills the air,
As frustration lingers everywhere.
We laugh and joke, but deep inside,
We're searching for a faster ride.

But even when you're slow and steady,
Python, we'll keep you at the ready.
For when the task is not a race,
You always find a comfy place.

Chorus

Oh, Python, you're a beast we love,
But speed's not from heaven above.
To make you fly, we twist and turn,
But faster speeds, we surely yearn.

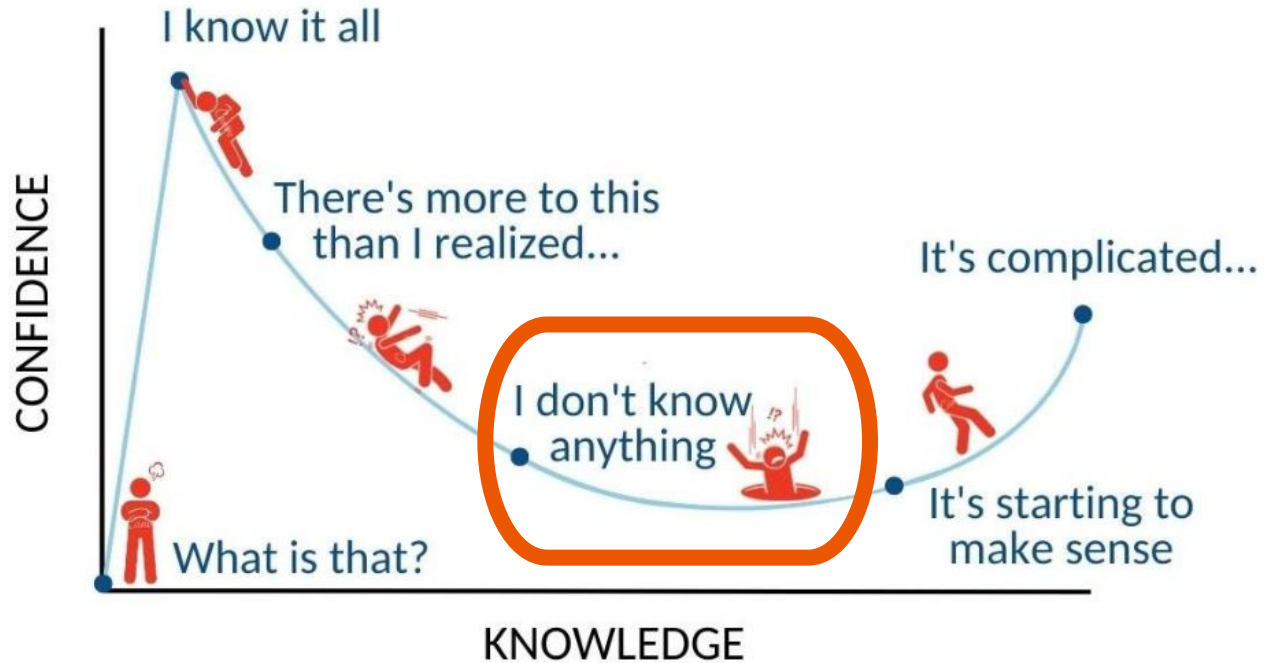
Outro

So in this course, with BBQ's flair,
We learned to code, with Python's care.
And though we jest, it's all in fun,
Python's power can't be outdone.
But if you need to fly with speed,
Just know that Python might not be the steed.

So grab some JAX or CUDA too,
And let the BBQ carry you through!

Results

Dunning-Kruger Effect



We have errors.... and some results

```
#####
Compute Mandelbrot area per tile until target uncertainty is reached
#####
    Uncertainty per tile is plotted in `uncertainty.png`
    Number of samples per tile is plotted in `samples_per_tile.png`
    The total area of all tiles is 1.5107973749999994
    The uncertainty on the total area is 8.599234244218499e-05

#####
TASK: Implement it on GPUs and break the world record!
#####
done.    resource usage:  19s runtime  116% CPU  295/8000MB RAM  /8000MB VRAM

-----
runtime: 27.37 s
=====
```

Summary



Wednesday afternoon



Wednesday evening

Outlook



Dealing With Depression & Anxiety In Programming

Traversy Media