Other things to think about.

Debugging numerics:

→ get serial implementation right.

→ things to check:

Does applying the operator to a specially constructed RHS produce what I expect?

Example: In 1D:

if $f(x) = x^2$

Then $-\nabla^2 f = -\partial_x^2 x^2 = -2\partial_x x = -2.$

We can check this numerically:

→ construct f, apply ∇^2 ensure the answer is 2.

⟹ augment the tests in the repo to add more.
feel free to widen test suite.

tests directory any file
named test_xyz.py
will automatically be scanned
for tests:
any functi named

$$\text{def test\_\_\_():}$$

$$\text{assert behaviour\_correct.}$$

Run with pytest

Grid convergence to known exact
solutions. MMS.

How does this work?
postulate soluti is u^*

Apply operator to u^*
to get $-\nabla^2 u^* =: f^*$

Then solve $-\nabla^2 u = f^*$
with BCs $u = u^*$ ⟵ don't forget this!

⟶ Look at the solution!

⟶ coursework code has facility to
dump output viewable in coursework.

- Write tests as you go
  ⟹ and save state via version control.
  ↳ "write a script while debugging
  & then once it works translate it
  into a test".