Numerical Methods with SciPy

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Review

1. Trapezoid rule

2. Simpson's rule

3. Newton's Method

4. secant method

Main Topics in Computational Methods

1. Integration

2. Linear Algebra

3. Root Finding

4. Differential Equations

Don't reinvent the wheel!

This runs counter to what we just did last class...

`scipy` has *everything* implemented already

You will often import a submodule via `from scipy import <something_else>`

What we did previously...

Integration:

- `scipy.integrate` has the methods we need
- Also works for ODE solving

Root finding:

- `scipy.optimize` has this (and a whole lot more!)

What we can do now...

Curve fitting:

- still in `scipy.optimize` ...

FYI: Linear Algebra:

- `scipy.linalg` (use arrays for matrices)

And more!

Let's Practice Together

- Example fitting code

- Fit the double Gaussian with `fitting.py`

- You can bring some research data on Thursday if you want.