

Numerical-Integral-Approximation

Uses matplotlib to visualize numeric integration techniques.

Purpose

1. Visualize left endpoint, right endpoint, midpoint, trapezoid, and simpson's approximations of integrals.
2. Graphically show the error each method gives for a given function

Requirements

1. [Python](#)
 1. [Matplotlib](#)
 2. [Sympy](#)
 3. [Numpy](#)

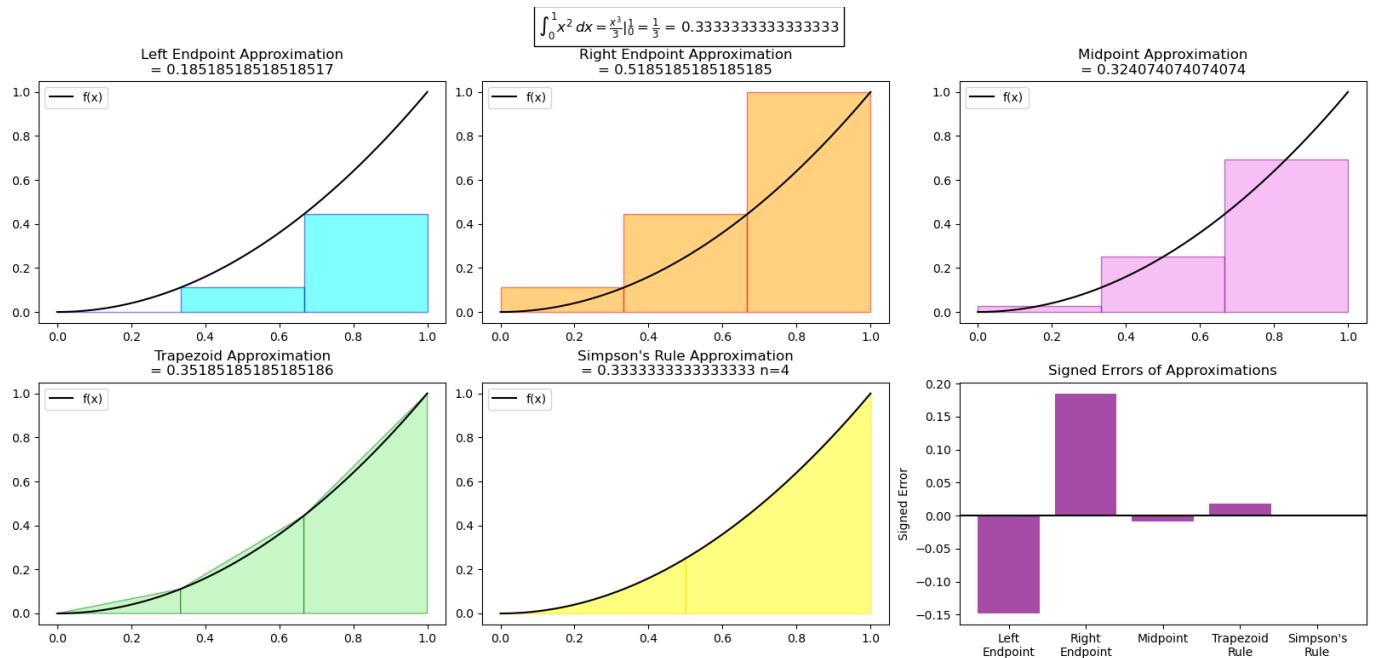
Install requirements with command: `pip install matplotlib sympy numpy` If that doesn't work, try this: `pip3 install matplotlib sympy numpy` If still not working ensure pip is installed: `python -m ensurepip --upgrade`

Instructions

1. Run `main.py`
2. Follow prompts to enter:
 - Function
 - Variable in function (x, t, etc)
 - Lower bound for integral
 - Upper bound for integral
 - Number of subintervals(# of Rectangles/Trapezoids)
 - Quality of Graph (Independant of Riemann Sum calculations just number of points used to plot)
3. Press Enter

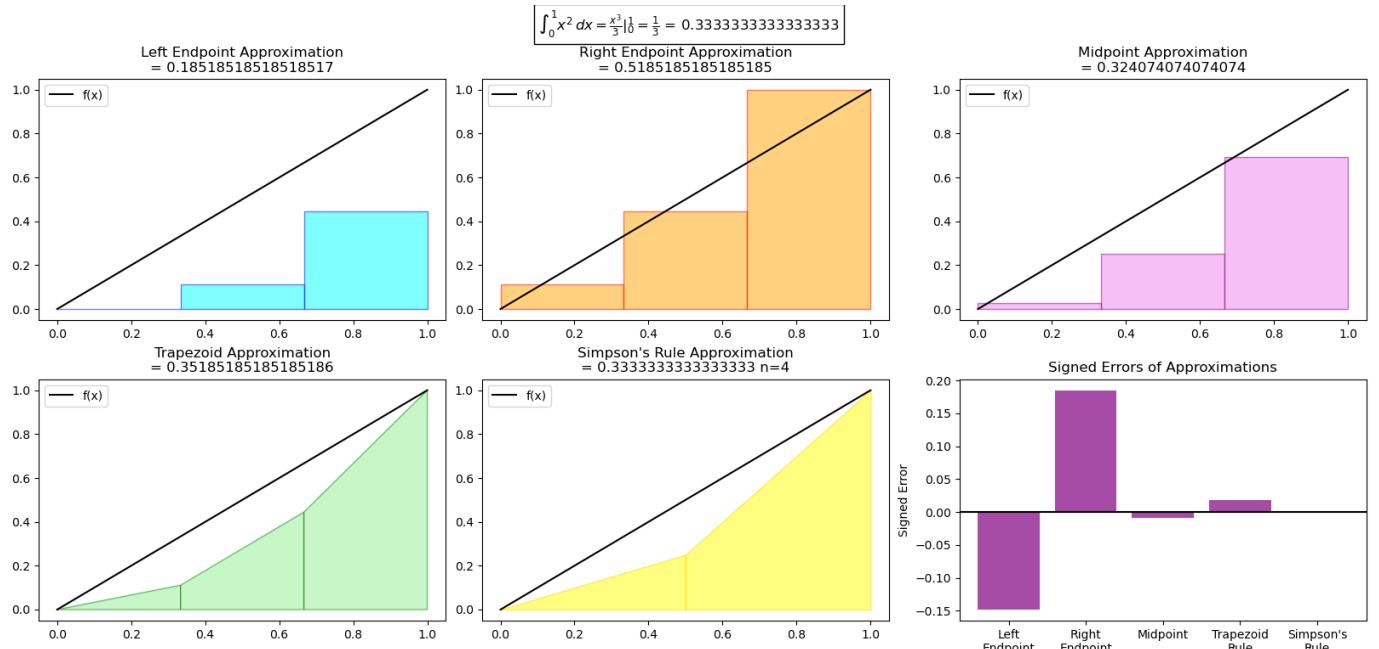
Examples

Default case, when user doesn't give function.



Same function as above, but with quality set to 2 instead of 1000

Notice that sum calculations are the same, only the quality of plot is affected.



Known Issues:

1. Divide by zero is not handled. If an endpoint is undefined the approximation will give nan or inf.

