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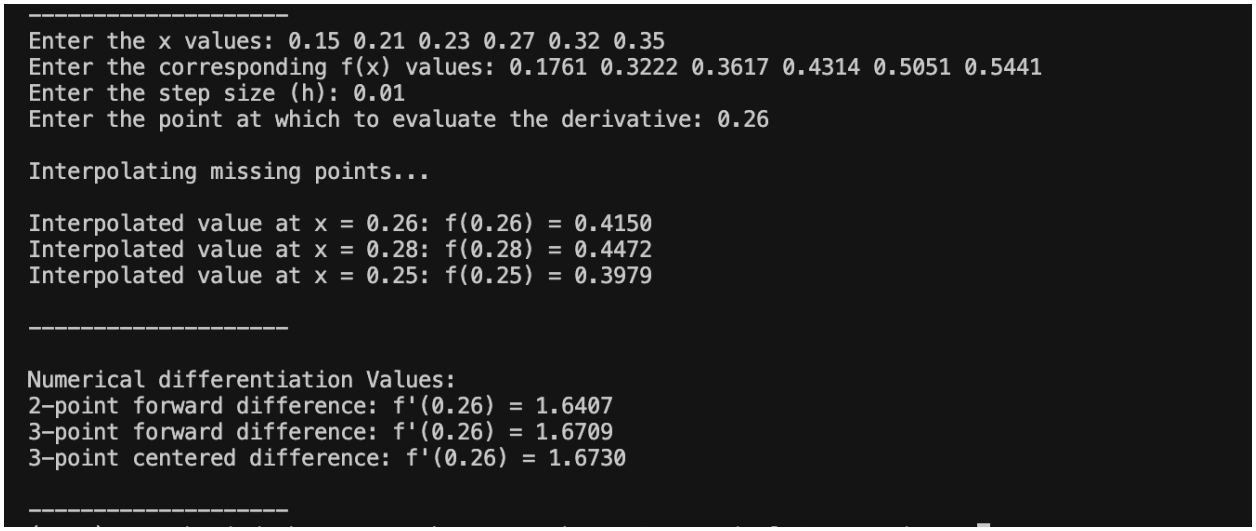
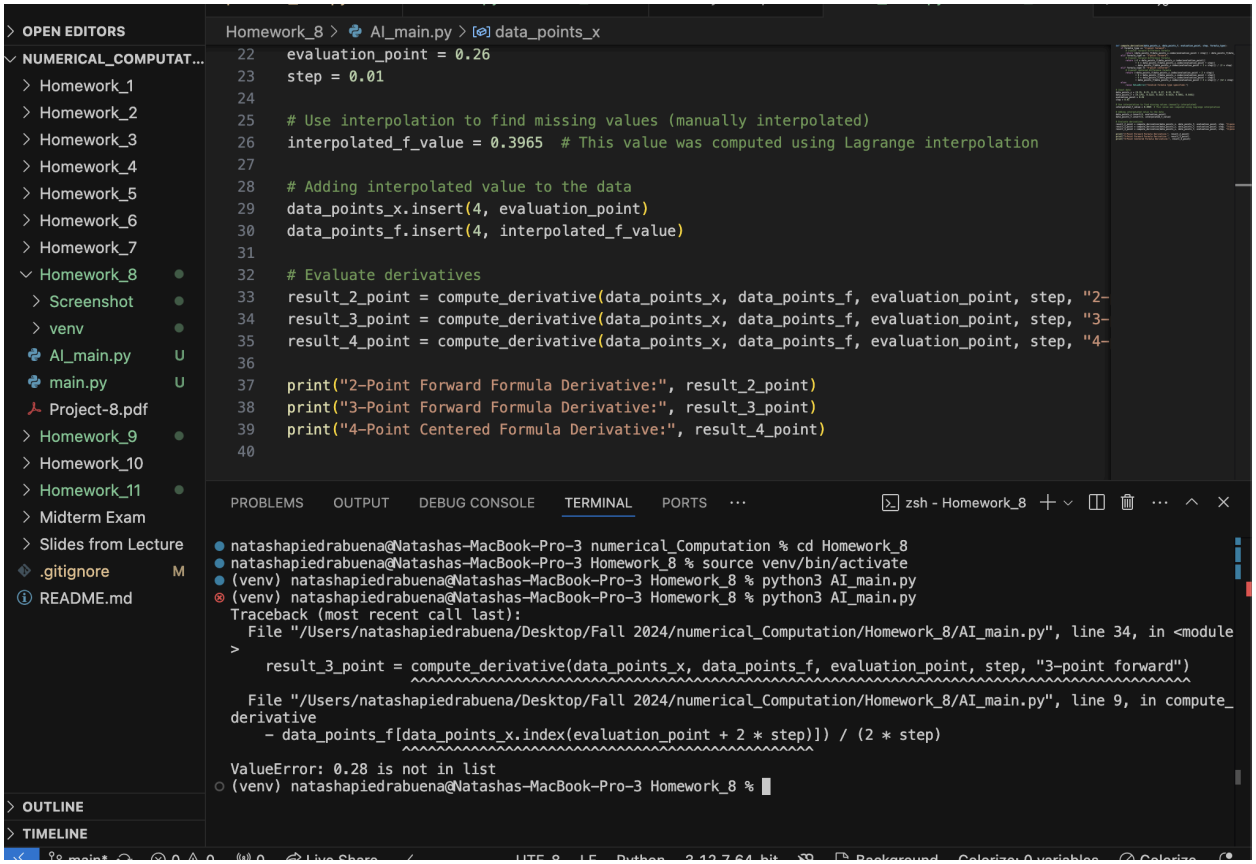
Numerical Computation
Homework 8

In this homework I outline the implementation of a function that calculates numerical derivatives using three differentiation formulas: the 2-point forward difference, the 3-point forward difference, and the 3-point centered difference.



It will take the values of x and corresponding f(x) and find the missing values and interpolate them to then compute the numerical differentiation of der at point 0.26.



The AI generated value computed the implementation incorrectly and I believe the reason it didn't run had to do with the function call and hallucination of certain functions that were never apart from the program. This happened before and I'm not surprised.

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Enter the x values: 0.15 0.23 0.32 0.35
Enter the corresponding f(x) values: 0.1761 0.3617 0.5051 0.5441
Enter the step size (h): 0.01
Enter the point at which to evaluate the derivative: 0.26

Interpolating missing points...

Interpolated value at x = 0.26: f(0.26) = 0.4154
Interpolated value at x = 0.27: f(0.27) = 0.4318
Interpolated value at x = 0.28: f(0.28) = 0.4475
Interpolated value at x = 0.25: f(0.25) = 0.3983

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Numerical differentiation Values:
2-point forward difference: f'(0.26) = 1.6404
3-point forward difference: f'(0.26) = 1.6731
3-point centered difference: f'(0.26) = 1.6758

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For the extra credit these are the values I have gotten for the numerical differentiation and the for interpolating missing points lagrange from hw 7.