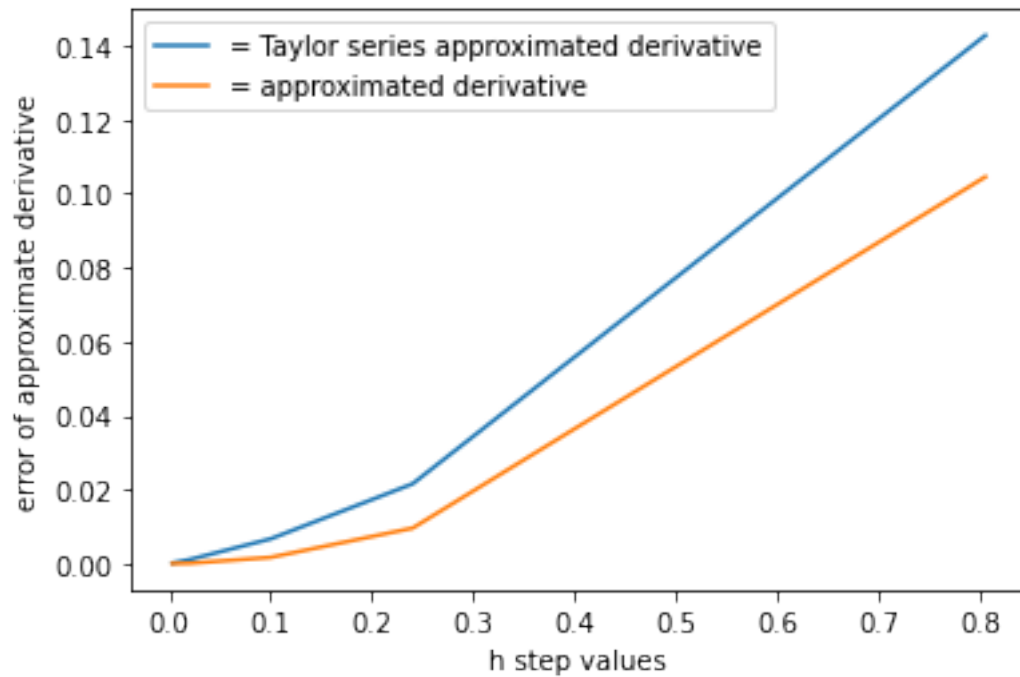# Homework Assignment 2

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May 2021

1 Question 1

To accomplish this task, I first began by defining the functions I would need; these were the approximate derivative function, the approximate derivative function using the Taylor series, and the error of the approximation of the numerical derivations. I then realized that all that needed to be accomplished inside this function was to approximate the value of the derivative, therefore meaning I simply had to return the results of the approximated derivative equation. I then defined all the variables I would need for the problem such as x not, d_analytical and the range of h values. Then I finally created a for

loop to run each of the functions, and collected that data inside the for loop then used a the python package 'mathplotlib' to display the data in a graph.

The plotted results of the error of the approximated derivative as a function of the h step size values, reveals as the value of h increases, the error in the approximated derivation increases proportionally after the value approximately at 0.15 step size. The graph also begins as almost horizontal for the h values ranging from approximately 0.0 to 0.2, signifying that that smaller values of h make the difference in error almost indistinguishable. This trend would increases with smaller values of h but decrease with larger ones as seen when the value of h reaches 0.8 and yields a large error in the approximated derivative.

2 Question 2

See email

3 Question 3

See email