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1 #Lagrange Interpolation: python script using numpy and scipy with visualization.
2
3 import numpy as np
4 from scipy.interpolate import lagrange
5 import matplotlib.pyplot as plt
6 #Enter the x values
7 x=eval(input('Enter the x values:'))
8 #Enter the corresponding y values
9 y=eval(input('Enter the y values:'))
10 #Enter the xp value where corresponding yp required to calculate
11 xp=eval(input('Enter the xp values:'))
12 #Interpolating as f using the function lagrange
13 f = lagrange(x, y)
14 print('The interpolated values of yp:\n', f(xp))
15 #visualizing the data points and interpolated polynomial
16 fig = plt.figure(figsize = (10,8))
17 #Plotting the interpolated data as continuous blue line and x, y data as red filled
    circle
18 plt.plot(xp, f(xp), 'b', x, y, 'ro')
19 plt.title('Lagrange Polynomial')
20 plt.grid()
21 plt.xlabel('x')
22 plt.ylabel('y')
23 plt.show()
24

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Enter the x values:[1,2,3,4,5]
Enter the y values:[2,4,6,8,9]
Enter the xp values:np.linspace(-1,5,30)
The interpolated values of yp:
[-7.          -5.38016573 -3.98367268 -2.78227183 -1.7495465  -0.86091242
 -0.09361767  0.57325731  1.15879968  1.68026428  2.15307353  2.59081751
  3.00525392  3.4063081  3.80207301  4.19880924  4.60094503  5.01107622
  5.42996631  5.85654641  6.28791527  6.71933927  7.14425243  7.55425637
  7.93912038  8.28678135  8.58334382  8.81307995  8.95842954  9.          ]

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