Homework 2

1 Questions

1.1 Q1

Finish the online Homework2 in `http://www.educoder.net`.

1.2 Q2

What is the time complexity of your Lagrange interpolation algorithm? What about your Newton interpolation algorithm?

1.3 Q3

Given $f(x) = \frac{1}{1+x^2}, x \in [-5, 5]$. Compute the interpolating polynomial based on the following points($x_k = x_0 + kh, k = 0, 1...n, h = 1$) sampled from $f(x)$ using both Lagrange and Newton interpolation algorithms finished in Q1.

$$x = [-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5]$$
$$f(x) = [0.0385, 0.0588, 0.1, 0.2, 0.5, 1.0, 0.5, 0.20.1, 0.0588, 0.0385]$$

Similarly, compute the interpolating polynomials when $h = 2$. Draw curves of the original function and your interpolating polynomials in one figure using any tools you like, such as Python, Matlab, Excel, etc. What do you find comparing the original curve with the interpolating curves? Describe it briefly.

2 Note

1. Do not cheat! We will check duplicates.
2. Due is Oct. 10th, 23:59. Finish the online judge, submit a PDF of the homework on the canvas. No late homework will be accepted!.