

# Lab02 Lagrange 插值

## 1 要求

对函数

$$f(x) = \frac{1}{1+x^2}, \quad x \in [-5, 5]$$

取以下两组节点

1.  $x_i = -5 + \frac{10}{N}i, \quad i = 0, 1, 2, \dots, N$
2.  $x_i = -5 \cos(\frac{2i+1}{2N+2}\pi), \quad i = 0, 1, 2, \dots, N$

计算Lagrange插值函数 $L_N(x)$ , 并计算如下的误差:

$$\max\{\|f(y_j) - L_N(y_j)\|, j = 0, 1, 2, \dots, 100\}$$

其中,  $y_j = -5 + 10/100 * j, j = 0, 1, 2, \dots, 100$ 。

## 2 输出

示例如下:

N=5

Max Error of grid (1) : XXXXXXXXXXXXXXXXXXXX

Max Error of grid (2) : XXXXXXXXXXXXXXXXXXXX

N=10

Max Error of grid (1) : XXXXXXXXXXXXXXXXXXXX

Max Error of grid (2) : XXXXXXXXXXXXXXXXXXXX

N=20

Max Error of grid (1) : XXXXXXXXXXXXXXXXXXXX

Max Error of grid (2) : XXXXXXXXXXXXXXXXXXXX

N=40

Max Error of grid (1) : XXXXXXXXXXXXXXXXXXXX

Max Error of grid (2) : XXXXXXXXXXXXXXXXXXXX