

# Numerical analysis Experiment Report

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## 1 Introduction

Construct equidistant node interpolation function for function

$$f(x) = e^x, x \in [0, 1]$$

The interpolation node is taken as

$$x_i = \frac{1}{N}i$$

Using two method to construct interpolation function.

First one is one piece linear spline.Second one is cubic spline.

Then calculate the max mid errors and convergence order with  $N = 5, 10, 20, 40$

## 2 Method

Construct equidistant node interpolation function.

## 3 Results

```
>> HW3
N = 5, max error1 = 1.230827e-02, max error2 = 1.090742e-05
N = 10, max error1 = 3.232810e-03, max error2 = 6.955865e-07
N = 10, order1 = 1.928767, order2 = 3.970937
N = 20, max error1 = 8.285329e-04, max error2 = 4.387129e-08
N = 20, order1 = 1.964158, order2 = 3.986881
N = 40, max error1 = 2.097304e-04, max error2 = 2.753776e-09
N = 40, order1 = 1.982023, order2 = 3.993794
>> []
```

## 4 Discussion

### A Computer Code

See attached files