**Supplementary Assignment #3**

Numerical Analysis

201621505 채진기

**1. Error Analysis for Itertative Methods**

**(a) Let f(x) = e^(x) – x – 1. Show that f has a zero of multiplicity 2 at x = 0.**

(answer) if, f has simple zero, there is a p that satisfies f(p)=0 and f’(p)~=0.

Let p = 0, then f(p)=0.

f’(x) = e^(x)-1, then f’(0)=0. So, f has a zero multiplicity 2.

**(b) Apply Newton’s method to f defined in (a) with p0=1 and calculate pn until n= 16.**

**What can you conclude about the rate of convergence?**

(answer) in this Table E1, the approximate of p is linearly reduced. The method yields Almost the half of previous value.

**(c) Apply Modified Newton’s method to f defined in (a) with p0 = 1 and calculate pn until n=5. What can you conclude about the rate of convergence?**

(answer) in this Table E2, the the approximate of p is quadratically reduced. Not linearly.

And compared to Newton’s method, the modified method yield the approximate presto.

**2. Muller’s method**

**(a) Explain the difference between the Secant method and Muller’s method.**

(answer) Secant method has 2 initial value and use the average rate of change between

2 point. And draw a line that pass two point. Then find the point that the line meet x-axis.

On the other hand, Muller’s method has 3 initial value and use them to make parabola.

Then, find the point that the parabola meet x-axis.