Numeric Methods Benchmark Analysis

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***Abstract*—The idea of this project is to test out if it is worth it to use C++ instead of Python for algorithms of some numeric methods, like finding roots of non-linear equations using Newton-Raphson's method.**

***Index Terms*—Numeric methods, C++, Python, algorithms, insert**

I. Introduction

Why this project? the aim of this project is to be able to analyze and draw a conclusion to the question, is it worth spending more time programming in C ++? Or is it more profitable to do this type of algorithms using Python and its libraries in terms of development time and program performance?

II. What will we test?

A. Algorithms

In this project we will only find roots of an equation using:

- Newton-Rapshon method.
- Bisection method.
- Secant method.
- Regula-Falsi method.
- Fixed-point iteration method.

B. G++ compiler

g++ (Ubuntu 9.3.0-17ubuntu1 20.04) 9.3.0

C. Python interpreter

Python 3.8.5

III. Newton-Raphson comparison

A. Variables

Equation: $x^3 + x^2 + 3$
Initial point: -20
Tolerance: 0.00001
Maximum number of iterations: 20

References

[1] Burden, Richard L. and Faires, Duglas. Análisis Numérico. Editorial Thomson. 9 Edición 2011.