**Numerical Analysis Lab**

**Project Proposal**

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**Aitkens Delta Squared Process**

In [numerical analysis](https://en.wikipedia.org/wiki/Numerical_analysis), Aitken's delta-squared process or Aitken Extrapolation is a [series acceleration](https://en.wikipedia.org/wiki/Series_acceleration) method, used for accelerating the [rate of convergence](https://en.wikipedia.org/wiki/Rate_of_convergence) of a sequence.

**Scope:**

Aitkens extrapolation can greatly accelerate the convergence of a linearly convergent iteration. This shows the power of understanding the behaviour of the error in a numerical process. From that understanding, we can often improve the accuracy, through extrapolation or some other procedure. This is a justification for using mathematical analysis to understand numerical methods.

**Requirements:**

* Introduction to Aitken formula
* Derivation of Aitkens Delta Squared Process
* Graphical introduction to Aitken Formula
* Analytical introduction to Aitken formula
* Example use of the Aitken formulas
* Steffensen’s Method

It introduces the concept and usefulness of convergence accelerators hopefully in a simple manner intelligible to any reader with minimal mathematical and engineering skills. The Aitken convergence accelerator is derived as an example with both intuitive explanations (every step is purposely made unnecessarily detailed for ease of understanding) and a simple demonstration. {\displaystyle x\_{k+1}=f(x\_{k}).}In numerical analysis, stefensen’s method is a root finding technique similar to newton’s method.