SEE-MATH : A Math Visualization Website

A THIRD YEAR PROJECT REPORT

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF B.Sc. IN COMPUTATIONAL MATHEMATICS

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CERTIFICATION

This project entitled "SEE-Math : A Math Visualization Website" is an original work carried out under my supervision for the specified entire period satisfactorily, and is hereby certified as a work done by following students

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ABSTRACT

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CHAPTER 1

Introduction

1.1 Background

See-Math is a website created for visualizing various algorithms of Numerical Methods. Designed using Jekyll and JavaScript, the website asks for appropriate inputs from the user and then generates tables for all iterations. It helps users visualize the solution through animations and graphs. The goal is to create a more friendly and comfortable environment for a better teaching-learning experience where they learn by seeing. The project focuses on being an exploratory tool for students to play around and discover firsthand mathematical beauty and patterns in algorithms and their underlying mathematics.

1.2 Objectives

1.2.1 Primary Objectives:

- To be able to have step by step visualization for numerical method algorithms.
- To have a user interactive platform for teaching and learning aid.

1.2.2 Secondary Objectives:

- Learn Web Development Frame work including back-end and front-end.
- Learning to build mathematical animations and interactive plots.

1.3 Motivation And Significance

- Provide platform for interactive visualization of algorithms.
- Improve on existing tools.
- Learn various tools for visualization and animation.
- Explore the field of web development.

1.4 Related Works

See-math is website for solving and visualizing various mathematical problems. The approach of solving problems is table based and graph based. Numerous works related to visualizing mathematical problems have been previously done, some of them being code-sansaar.com, atozmath.com, keisan.casio.com, planetcalc.com and many more. Most of the mentioned websites solve the problems and display output table-based without graphical representations but some websites such as planetcalc.com have improved by taking into consideration previous works and adding new aproaches such as graphical representaions along with table based ones but yet have not made visualization possible for all mathematical problems.

The main contribution of our work to this problem is the implementation of graph based visualization along with table based outputs. The impact of our approach that adresses these existing limitation is going to help on better understanding of various mathematical problems.

CHAPTER 2

Design And Implementation

CHAPTER 3

System Requirement Specification

3.1 Software Specification

3.1.1 Front-End Tools

- **Front-End Design** : HTML, CSS, Jekyll , Ruby, Markdown
- **Code Editor** : Visual Studio Code
- **Browser** : Any modern browser that supports JavaScript

3.1.2 Back-End Tools

- **Back-End Tools** : JavaScript

3.1.3 Utility Tools

- **Source Control** : Git, GitHub
- **Project Management** : Viber, Gmail
- **Report Writing** : Latex

3.2 Hardware Specification

Any modern computer with computing power enough to connect to the Internet via a browser that supports JavaScript and follows standard web protocols.

CHAPTER 4

Discussion On The Achievements

4.1 Features

CHAPTER 5

Conclusion And Recommendation

5.1 Limitations

See-math is a website meant for visualizing mathematcal problems and gaining better understanding of the problem. The goal of the website is to solve and visualize as much mathematical problems as possible but current only some of the problems reated to numerical methods such as bisection methon and newton raphson method can be fully calculated and visualized.

5.2 Future Enhancements

The current see-math lacks in comaprisoin to the ideal visualization website meant to solve numerous mathematical problems. Various methods are yet to be added and many enhancements are yet to be made and in the near future various features and new method will slowly but surely be included.

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