**DE LA SALLE UNIVERSITY – MANILA**

**2401 Taft Avenue, Malate, Manila**



**Enrollment System**

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A Term Project

Presented to **RUIZ, RAMON STEPHEN L.**

In Partial Fulfillment of the

Requirements for the Course Computer Fundamentals and Programming 1 (LBYEC2A)

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By

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***Mathematical Visualization Tool***

Introduction (Chielee)

The Mathematical Visualization Tool helps users to understand and explore mathematical problems to a certain extent. It is an efficient programming tool to accurately complete complex equation with a proper visualization in order to save time and lower the possibility of human error, this can provide a deeper understanding towards mathematical concepts that can define mathematical functions and plots to a certain graph, features such different types of average: Plotting,Mean, Median, Mode, metric values and volumetric values are given the functions. In terms of solving, it enables us to perform certain operations using trigonometric functions and algebraic expressions. Given its features, there are limitations/ constraints with regards to its functions,not all equations and visualization can be satisfied to its full extent. In comparison to more specialized programs in other mathematical areas, it might not offer the same depth of capability. The mathematical visualization tool focuses mainly on common mathematical topics.

Objectives:

1. To solve different types of mathematical functions such as trigonometric function and algebra expressions
2. To determine a visual representation of certain point on a graph
3. To generate an efficient mathematical tool for complex computations/graphs.

Features:

* Enables to determine mathematical functions and plots to a certain graph.
* Enables to perform certain operations using trigonometric functions and algebraic expressions.
* It has a feature where it can convert metric values and volumetric values.
* It can also solve the different types of average: Mean, Median, Mode.
* Will ask for the values of a, b, c from the standard form for linear equation Ax + By = C

**Methodology (Enrique)**

Team Demeter will implement a 5-Phase plan in order to complete the code. Given the complexity of creating the Mathematical Visualization Tool, the team will initially set the parameters of the program in order to not set an unattainable objective and then begin with the flowchart crafting. The 5-Phase plan is as follows:

**Phase 1 - Flowchart**

Create a flowchart to streamline the code creation process, the flowchart will define the parameters and objectives of the program, in this case, it will show what mathematical functions it will visualize and show what the required output is.

**Phase 2 - Initial code framework**

Create the “skeleton” code for the program, adding basic functionalities and adding a safety net for cases like user input errors and math errors.

**Phase 3 - Supplementary coding and testing**

Create the code for separate cases that the user may want to input or not, namely, graphing functions of y up to the 4th degree, identifying statistical means, median, mode, standard deviation, and variance. This will also be the start of the testing phase, identifying whether or not the specific cases function correctly; a sample input will be placed and the team will check to see if the sample output is displayed in the program.

**Phase 4 - Debugging**

Once the code is around 80% complete, the team will look for any bugs by using more sample input and comparing the results of the program to the projected output. If there is an error, the team will identify the problem by running through the flowchart again and seeing if there are any errors along the way. This phase may be integrated alongside Phase 3.

**Phase 5 - Finalizing Code**

Once the program provides the correct projected output from each sample input, the team will assess if the program is completely free of any major bugs. Once this is attained, the team will work on general UI and some finishing touches assuming there are some additional cases for certain functionalities. The code will be run a few more times before being deemed complete. Additionally, a user manual will be created during this phase

**Deliverables (Enrique)**

Team Demeter will divide the task with the following Gantt Chart. Provided is the color code of how the tasks will be divided:

**ALL MEMBERS**

**CHIELEE**

**MIGO**

**ENRIQUE**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| WEEK 1 | | | | | | |
| Goal | 13 | 14 | 15 | 16 | 17 | 18 |
| PHASE 1 |  |  |  |  |  |  |
| PHASE 2 |  |  |  |  |  |  |
| PHASE 3 |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| WEEK 2 | | | | | | |
| Goal | 20 | 21 | 22 | 23 | 24 | 25 |
| PHASE 2 |  |  |  |  |  |  |
| PHASE 3 |  |  |  |  |  |  |
| PHASE 4 |  |  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| WEEK 3 | | | | |
| Goal | 27 | 28 | 29 | 30 |
| PHASE 4 |  |  |  |  |
| PHASE 5 |  |  |  |  |

Additionally, the team will create a user manual during the final phase of the creation of the program.

**Evaluation (Migo)**

The evaluation of the Mathematical Visualization Tool will be based on different mathematical equations, wherein users will input a specific equation that the program will answer. In this, the developer will foresee if the program has provided an incorrect visualization. The user interface and the program system will also be evaluated, different tests will be done based on the objectives to evaluate if the system has some errors. This evaluation will test the overall performance of the program.

The team will provide a set of tests in which the program will be tested. The following are:

* User will input a mathematical equation graph, wherein the program will provide a visual representation.
* Statistical problems, such as Mean, Median, Mode, Standard Deviation, and Variance will also be tested to determine if the program can run and visualize the equation.
* The user-interface and system will also be tested to determine if the program can run properly without having an error and lag.

**Conclusion (Migo)**

Overall, the Mathematical Visualization Tool aims to assist users who are seeking in visualizing a mathematical and statistical problem. This program will make an impact, especially in the field of engineering, a mathematical tool that can visualize a problem will change the perspective of a user.

**References:**

**This project draws similarities to Desmos:** [**https://www.desmos.com/calculator**](https://www.desmos.com/calculator)

VKS, S. and. (n.d.). *Making a versatile calculator using MATLAB GUI programming*. Digital iVision Labs! https://www.divilabs.com/2015/05/making-versatile-calculator-using.html?fbclid=IwAR0ELSGa69J64kIq\_JsTmLUQR4r5BXlLCBzKOVold4RU-N\_QSuMsh96D1-8