Graphing Calculator GUI

Software Requirements and Specifications (SRS)

- **Introduction**

The purpose of this document is to define the requirements for a graphing calculator that is able to be used on a phone and on a desktop. The goal of this software is to provide a user-friendly interface that is easy to use on a daily basis for graphing functions and so on. This graphing calculator will provide multiple functions that are not only graphing related, but also a mix of scientific and classic calculator functions.

- **Functional Requirements**
  - A graphing calculator app must provide the following features:
    - Traditional calculator with buttons for numbers (0-9)
    - Basic operations (+, -, *, /)
    - Parentheses, memory functions (M+, M-, MR, MC), and a clear © button
    - Trigonometric function and its inverse functions (Sine (sin) Cosine (cos) Tangent (tan) Secant (sec) Cosecant (csc) Cotangent (cot))
    - Logarithmic functions (log, ln), exponential functions (^), scientific notation, constants (π, e), and a history panel to view past calculations.
    - Graphing abilities to plot functions and equations
    - A graph interface where users can set window size, x and y, ranges, and different types of data plot
    - Ability to do standard deviation calculations and other complex calculations
- **Non-Functional Requirements**
  - A graphing calculator app may contain the following qualities:
    - **Reliability:** The graphing calculator must be able to recall history of previous equations or data input. This data must be stored within the calculator and should have a button to fully reset the calculator
    - **Inputs:** The graphing calculator must accept the user's inputs which include equations (real and imaginary values) as well as complex functions (trigonometry, pi, etc.)
    - **Outputs:** The graphing calculator should display answers for the asked equations. However, if answers are non-real numbers, then user must switch the settings so the output would be in complex number form. Furthermore, if a user asks for angle related equations, settings must show that user wants the answer in degrees or radians.
- **User Interface**
  - A graphing calculator interface should/must show the following features:
    - Traditional calculator with buttons for numbers (0-9)
    - Basic operations (+, -, *, /)
    - Parentheses, memory functions (M+, M-, MR, MC), and a clear © button
    - Trigonometric function and its inverse functions (Sine (sin) Cosine (cos) Tangent (tan) Secant (sec) Cosecant (csc) Cotangent (cot))
    - Logarithmic functions (log, ln), exponential functions (^), scientific notation, constants (π, e), and a history panel to view past calculations.
    - Graphing abilities to plot functions and equations
    - A graph interface where users can set window size, x and y, ranges, and different types of data plot
    - Ability to do standard deviation calculations and other complex calculations
- **Input and Output**

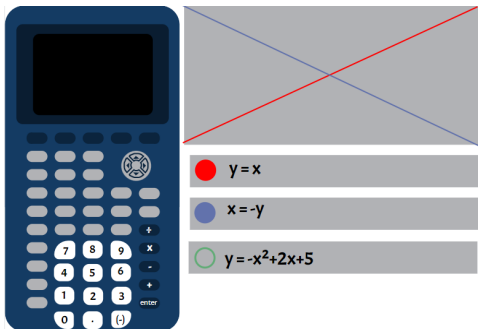
    - A graphing calculator should display the input information (equations that are required to be solved) as well as the solution in the desired setting/format
- **Technical Specific**
    - The graphing calculator will bedeveloped using web-based technologies, such as HTML, Bootstrap, CSS, and JavaScript
- **Error Handling Requirements**
    - The graphing calculator should be able to detect whether the given question is non-real numbers, error (meaning that the format of the input is not specified)
- **Testing Requirements**
    - The graphing calculator should be tested using the following methods:
        - **Manual Testing:** The calculator should be tested manually by putting in actual numbers and doing a simple problem (addition, subtraction, multiplication, division) or other simple arithmetic
        - **Acceptance Criteria:** The calculator should be considered acceptable if it passes all manual tests
- **Assumptions and Constraints**
    - The following are the assumptions and constraints considered during the development of the Graphing Calculator (for PC and mobile devices)
        - The calculator is developed using web technologies and is compatible with modern web browsers
        - The app is designed to work on various devices, such as desktops and mobile devices

User Preferences of Using a Calculator (Questionare)

- **What type of device do you use on a daily basis?**
    - **Computer/desktop**
    - **Laptop**
    - **Ipad/tablet**
    - **Phone**
    - **Other**
- **What Operating System do you use?**
    - **Windows**
    - **Linux**
    - **Apple**
- **Specify the Operating System most current update (optional)**
    - **Windows 11**
    - **Windows 10**
    - **Windows 9 and below**
    - **macOS 14**
    - **macOS 13**
    - **macOS12**
    - **macOS 11**
    - **macOS 10.5 and below**
    - **Linux OS**
- **What device do you use a calculator on for a daily basis? (Other than an actual calculator)**
    - **Computer/desktop**
    - **Laptop**
    - **Ipad/tablet**

    - **Phone**
    - **Other**
- **What kind of calculations do you do on a calculator?**
    - **Simple arithmetic (addition, subtraction, multiplication, division)**
    - **Logarithmic**
    - **Angle calculations**
    - **Other**
- **How often do you use a calculator?**
    - **Everyday**
    - **A few days a week**
    - **Once a month**
    - **Every once in a while**
    - **Never**
    - **Other**
- **What features do you consider essential in a calculator? How about a graphing calculator?**
    - **Simple arithmetic (addition, subtraction, multiplication, division)**
    - **Logarithmic**
    - **Angle calculations**
    - **Graphing interfaces**
    - **Other**
- **How important is the user interface (appearance, ease of use) of a Graphing Calculator to you?**
    - **Very (5)**
    - **Yes, but not that much (4)**
    - **Sometimes (3)**
    - **Not really (2)**
    - **Never (1)**
- **What other essential features do you think is necessary for a calculator? Describe.**

Calculator Design and Explanation

			
This is the design that is going to be used for desktop/laptop/computer users. The interface shows the actual calculator where user can input the data needed as well as displaying the actual graph on the side. The graph can be zoomed in and out. Furthermore, the equations can be disabled as needed (shown in equation 3)	This interface shows the design that is going to be used for mobile devices. It depicts the feel of an actual calculator, but digitally. All the buttons are there to simulate an actual calculator	This is the actual calculator, if a person would had a real one.	A close-up picture of what the buttons would have said on them.