**National University of Computer & Emerging Sciences Karachi Campus**



**TITLE OF PROJECT: MatCLI**

**Project Proposal**

**Programming Fundamentals**

**Section: F**

**Group Members:**

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Proposal Report: Advanced Calculator Implementation

**1. Introduction**

The purpose of this proposal is to outline a project to develop an advanced calculator capable of performing a wide range of mathematical operations. This calculator will provide functionalities for arithmetic, trigonometric, algebraic, and matrix calculations, catering to the needs of students, professionals, and researchers alike. The proposed system aims to fill a gap in the market by offering a comprehensive and user-friendly mathematical tool.

**2. Existing Systems**

Currently, there are various calculators available in the market, ranging from basic handheld calculators to advanced scientific calculators and software applications. However, these existing systems have limitations when it comes to the breadth of mathematical operations they can perform. Basic calculators lack advanced functions, and scientific calculators may not cover advanced algebraic or matrix operations comprehensively.

**3. Problem Statement**

The existing mathematical calculators and software tools do not offer a single, user-friendly solution for all mathematical operations. Users often need to switch between different tools, which can be time-consuming and inefficient. This creates a need for an all-in-one calculator that can handle arithmetic, trigonometric, algebraic, and matrix calculations seamlessly.

**4. Proposed Solution**

We propose the development of an advanced calculator software application that will address the limitations of existing systems. This application will provide a comprehensive set of mathematical functions, including:

Arithmetic operations (addition, subtraction, multiplication, division).

Trigonometric functions (sine, cosine, tangent, etc.).

Algebraic calculations (for example: solving equations).

Matrix operations (matrix addition, multiplication, determinant calculation, etc.).

**5. Salient Features**

The proposed calculator will offer several key features that set it apart from existing systems:

Comprehensive Functionality: It will support a wide range of mathematical operations, making it a one-stop solution for various mathematical needs.

Step by step solution: along with the final answer the calculator will display step by step working.

Cross-Platform Compatibility: The calculator will be available on any OS, ensuring accessibility on various devices.

**6. Tools and Technologies**

To implement this project, we plan to use the following tools and technologies:

Programming Language: We will use a high-level language: C-language.

Mathematical Libraries: To perform complex mathematical calculations, we will leverage mathematical libraries such as math.h (for C).

Version Control: We will use Git and GitHub to manage the project's source code and collaborate with team members.

In conclusion, the proposed advanced calculator project aims to address the limitations of existing systems by providing a user-friendly, all-in-one mathematical tool capable of handling arithmetic, trigonometric, algebraic, and matrix calculations. This project has the potential to benefit a wide range of users and fill a gap in the market for comprehensive mathematical calculators.

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