



CS PROJECT

SCIENTIFIC CALCULATOR

TEAM MEMBERS :

1. AMIT SACHAN. (team leader)

2. TEJASWINI ALLIKANTI.

3. RAHUL CHAUDHARY.

GUIDED BY:

ARUN BABU (CLTA).

INTRODUCTION

Scientific calculator is a type of electronic calculator, usually but always hand held designed to calculate problems in science, engineering and mathematics.

The electronic calculator can carry out the exponential, trigonometric functions, etc. and other advanced operations.

Why use scientific calculator?

Scientific calculators are used widely in any situation where quick access to certain mathematical functions is needed, especially those such as trigonometric functions that were once traditionally looked up in tables; they are also used in situations requiring back-of-the-envelope calculations of very large numbers, as in some aspects of astronomy, physics, and chemistry.

Calculators make our work very simple and tedious calculations can be done in one go. This facilitates the user to work on ideas rather than doing laborious work.

OUR SCIENTIFIC CALCULATOR CALCULATES THE VALUES OF ALL FUNCTIONS WITHOUT USING CMATH LIBRARY.

FUNCTIONS that can be done in calculator:

1. Standard calculations (eg. addition, subtraction, finding ${}^n\text{P}_r$, ${}^n\text{C}_r$, absolute value numbers, etc.)
2. Higher power of number.
3. Factorial of number.
4. Exponential of a number.
5. Logarithmic of a number.
6. Trigonometric function.
7. inverse trigonometry function.
8. Integration of some simple functions.
9. Differentiation of simple functions.
10. Operations on vectors and complex numbers.
11. Conversion of base of numbers.
12. Conversion of units.
13. Physical constants.
14. solving quadratic equations .
15. Operations on matrices.
16. Conversion of co-ordinates (eg. polar-rectangular)

17. HELP option.

18. Finding the equation of plane in two different ways.

19. Finding equation of planes.

DIVISION OF THE TASK:

1. TEJASWINI ALLIKANTI

SRS, inverse trigonometry and trigonometric functions, physical constants and conversion of units and exponential function and standard calculations.

2. RAHUL CHOUDHARY

User manual, Help function, quadratic equation, inverse trigonometry and trigonometric functions and logarithmic functions, standard calculations, integration and differentiation .

3. AMIT SACHAN

Square root function, conversion of co-ordinates and base of numbers, higher power of any no, operation of matrices, operation of complex numbers inverse trigonometry and trigonometric functions, vectors integration and differentiation and user manual.

PROBLEM DEFINITION

FUNCTIONS DEFINED ARE:

1. double standard_calculations()

This function will do some simple calculations like addition, subtraction, multiplication, division, etc. By taking required values from user.

2. double logarithmic()

This function will calculate the logarithmic value of the number given by user.

3. double exponential()

This function will calculate the exponential value of the number given by user.

4.double factorial()

This function will perform simple iteration to calculate factorial of a number.

5. double trigonometry()

This function first checks whether the value given by user lies in the domain of the function and then calculates the value of it by using appropriate expansion. We find sin of function and then find the other trigonometric functions from that. .

6. double inverse_trig()

This function first checks that the value given by user lies in the domain of the operator then calculates the value of it by using appropriate expansion. It calculates the inverse sine of function and then calculate the other inverse functions from that.

7. `double integration()`

This function will integrate the different function given of some simple trigonometric functions.

8. `double differentiation()`

This function will differentiates the function given some simple trigonometric functions .

9. `double quadratic()`

This function will take the coefficients of the quadratic equation than computes the value of unknown variable in the given equation using shri dharacharya formula.

It also tells whether the roots are quadratic or not.

10. `void convert_digits()`

This function converts numbers from one base to another. Initially it asks the user about which conversion he wants to perform and then converts it accordingly .(eg.binary to decimal,decimal to hexadecimal etc...)

11. `double convert_units()`

This function convert one type of unit to other (eg.cm to m,kg to gm,lts to gallon etc..) Initially it asks the user about which conversion he wants to perform and then converts it accordingly.

12. `double physical_const()`

This functions helps the user to get values of different scientific constants. It asks the user to enter the value of number associated with the constant which is the mentioned in the list. The list shows up when option of physical constants is chosen.

The function will give the desired constant to the user.

13. `void matrices()`

This function first ask the user that he want's to compute determinant of some matrix or he want's to find the value of unknown variable by solving simultaneous linear equation using matrix.

14. `HELP()`

This is the most interesting function, this act as a maths dictionary in which user can search for any mathematical definition of all functions and operators.

15. `double conversion_of_coordinates()`

This function helps user to convert one form of coordinates to other eg. Rectangular coordinates to polar co-ordinates.

It also validates the input given by the user.

17. `double permut_combi_()`

In this function user wants to calculate nCr and nPr and it will be done by the use of iteration.

18. `void vectors ()`

In this function operations on vectors are carried out.

It asks the user whether he wants to use a vector with three co-ordinates or with two co-ordinates and carries out operations like vector product, scalar product, addition, etc. on the vectors.

19. `void complex numbers()`

In this function standard operations on complex numbers are carried out.

APPENDICES

www.wikipedia.com (for introduction and to understand the format of SRS.).

www.cplusplus.com (for learning C++ and other topics related to code)

www.youtube.com (for seeing sample code and understanding different functions of scientific calculator.)

support.casio.com (for knowing all different functions of scientific calculator)

[previous years' submission](#)(to understand the format and level of project to be done.)