

CS 101 PROJECT

SCIENTIFIC CALCULATOR

USER MANUAL

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PREFACE

This documents are about our CS 101 project 'scientific calculator' . we as a team tried to implement many functions which are surely useful for the users . by making this project ,it was a very nice chance for us to learn any things like making SRS document ,making diaries, to work as a team ,the advantages of being a team and many more.

We have taken reference of books like ' Introduction to computer programming through cpp' by professor **ABHIRAM .G. RANADE.**

We also want to thank our professor **Dr. D.B Pathak** and **Dr. S.Chakraborty.**

And at last but not the least I want to thank our TA for his support and help and helped us to understand the most challenging tasks of the project.

INTRODUCTION

The scientific calculator made in this project comprises of various functions which are useful in our daily purposes and which are difficult to calculate without calculators.

I hope that this calculator will benefit many .

In this manual we will be providing the list of functions ,how to operate the calculator and detailed instructions of some functions which are difficult to operate.

LIST OF FUNCTIONS

- Simple Mathematical operations

It can perform very simple but important functions like

:-addition

:-subtraction

:-multiplication

:-division

:-finding percentage

USAGE: To use these functions just write a simple mathematical expression involving these operators.

- Trigonometric Functions

The calculator calculates

:sin

:cos

:tan

:cot

:sec

USAGE:

To use this functions please follow some very basic steps:

Press sign and write in parentheses the number whose say sine is to be calculated and be careful to write this in radians.

For example: let us suppose we have to calculate the cosine of 1 ,simply press cos and press 1 and then 'equals to' to find $\cos 1$.

- INVERSE trigONometric FUNCTIONS

:-arcsine

It calculates the angle for which the value of sine will be equals to the argument entered by user given that the argument given by the user must be between $\{-1, 1\}$

:-arcos

It calculates the values of the angle for which the value of cos will be equal to the value entered by the user given that the argument given by the user must be between $\{-1, 1\}$

:-arc tan

It calculates the value of angle for which the value of tan will be equal to the argument entered by the user .there is no such found on the value entered by the user.

For example : we have to calculate the value of arcsine(0.5), just press the option and type the argument.

- Hyperbolic Functions

:- sinh{x}

It is a function whose expression is given by
 $(e^x - e^{-x})/2$

:-cosh{x}

It is a function whose expression as a function of x is
given by $(e^x + e^{-x})/2$

:-tanh{x}

It is given by a expression as function of x as
 $(e^x - e^{-x})/(e^x + e^{-x})$

For example, if we want to calculate the value $\sinh(3)$, Just press the button and type the argument and I will take this as the value of x and will find the value.

- EXponential and LOGarithmic FUNCTIONS

:- exponent to the base

USAGE: Suppose we have to calculate 2^5 then just press 2 and press “^” and press 5, and your job will be done.

:- exponent

It will calculate the value of the argument given to the base “e”.

USAGE: simply press ‘e’ and write the argument in parentheses.

Suppose we have to calculate e^7 ,then press ‘e’ and press 7 in parentheses.

$:-\ln(x)$

It calculates the log to the base 'e' of argument given by the user.

For example: to calculate $\ln(20)$,press \ln and then press 20 and the result will be in the bar.

$:-\log x$

calculates the log of the argument to the base 10.

For example : same as $\ln x$.

- power operations

:- square

Calculates the square of any argument given by the user.

:- cube

Calculates the cube of any argument given by the user.

USAGE: just press the cube and enter the argument for which the value has to be calculated.

:-square root:

Calculates the square root of any non negative real number given by the user.

USAGE: first press the cube root or square root button and then enter the argument for which it is to be calculated.

:- Nth root:

Calculates the Nth root of any given argument specified by the user, and also N is user specified.

USAGE:

This we have to in two steps:

**** first we have give the value of N ,means which root we want calculate;**

**** then press the Nth root button and give the value of the argument;**

- Factorial based operation

:- factorial

Calculates the value of factorial of any positive integer given by the user.

For example : just type the positive integer and press the button and it will calculate its factorial.

:- nCr

Calculates the no. of combinations of 'r' out of 'n' distinct objects.

:- nPr

Calculates the no. of permutations of 'r' distinct objects out of 'n' distinct objects.

USAGE:

Type the value of 'n' and then press combination or permutation and then type the value of 'r'

- SOLVING SYSTEM OF LINEAR EQUATIONS

This will give a solution to a multivariable linear equation given that enough number of equation are given.

USAGE:

Just click on linear equation,

then type the number of variable and then it will ask for first equation and give the values coefficient of variables and coefficient.

- 9 SOLVING quadratic equation

It will give the roots of quadratic equation .

USAGE:

Press the quadratic equation and then give the coefficients of x^2 ,then x and then constant . if possible it will give the solution of equation.

- CONVERSIONS

It converts a value from one unit to another unit of same dimension.

It was all about the working of the functions.

• Integration

1. $\sin x$
2. $\cos x$
3. $\tan x$
4. $\cot x$
5. $\sec x$
6. $\operatorname{cosec} x$
7. $\sec^2 x$
8. x^n
9. e^x
10. $\ln x$

In all these functions what user has to do is that he has to give the lower limit, as the input, followed by the upper limit. The selected function will give the integral of the corresponding function over the range of the limits given.

For example, let us calculate the integral of $\sin x$ from 0 to 1. So, we will have to input 0 followed by 1, to get the integral, which will come out to be equal to $\cos 0 - \cos 1$.