

1.Introduction

A scientific calculator is a type of electronic calculator, usually but not always handheld, designed to calculate problems in science, engineering, and mathematics. They have almost completely replaced slide rules in traditional applications, and are widely used in both education and professional settings.

In certain contexts, such as higher education, scientific calculators have been superseded by graphing calculators, which offer a superset of scientific calculator functionality along with the ability to graph input data and write and store programs for the device. There is also some overlap with the financial calculator market.

1.1History

The first scientific calculator that included all of the basic ideas above was the programmable Hewlett-Packard HP-9100A,[1] released in 1968, though the Wang LOCI-2 and the Mathatronics Mathatron[2] had some features later identified with scientific calculator designs. The HP-9100 series was built entirely from discrete transistor logic with no integrated circuits, and was one of the first uses of the CORDIC algorithm for trigonometric computation in a personal computing device, as well as the first calculator based on Reverse Polish Notation (RPN) entry. HP became closely identified with RPN calculators from then on, and even today some of their high-end calculators (particularly the long-lived HP-12C financial calculator and the HP-48 series of graphing calculators) still offer RPN as their default input mode due to having garnered a very large following.

1.2Functions

Modern scientific calculators generally have many more features than a standard four or five-function calculator, and the feature set differs

between manufacturers and models; however, the defining features of a scientific calculator include:

- scientific notation
 - floating point arithmetic
 - logarithmic functions, using both base 10 and base e
 - trigonometric functions (some including hyperbolic trigonometry)
 - exponential functions and roots beyond the square root
- quick access to constants such as π and e

1.3Uses

Scientific calculators are used widely in situations that require quick access to certain mathematical functions, especially those that were once looked up in mathematical tables, such as trigonometric functions or logarithms. They are also used for calculations of very large or very small numbers, as in some aspects of astronomy, physics, and chemistry.

They are very often required for math classes from the junior high school level through college, and are generally either permitted or required on many standardized tests covering math and science subjects; as a result, many are sold into educational markets to cover this demand, and some high-end models include features making it easier to translate a problem on a textbook page into calculator input, e.g. by providing a method to enter an entire problem in as it is written on the page using simple formatting tools.

2.Objectives

2.1 To be familiar with Python programming language

Python is an interpreted high-level programming language for general-purpose programming. Created by Guido van Rossum and first released in 1991, Python has a design philosophy that emphasizes code readability, notably using significant whitespace. It provides constructs that enable clear programming on both small and large scales. In July 2018, Van Rossum stepped down as the leader in the language community after 30 years.

Python features a dynamic type system and automatic memory management. It supports multiple programming paradigms, including object-oriented, imperative, functional and procedural, and has a large and comprehensive standard library.

Python interpreters are available for many operating systems. CPython, the reference implementation of Python, is open source software and has a community-based development model, as do nearly all of Python's other implementations. Python and CPython are managed by the non-profit Python Software Foundation.

2.2 To implement various mathematical operations in Python

The project will be a simple Scientific Calculator implementation in Python. use various calculations to calculate different mathematical operations. The output of the project will be a console application with graphics. User should implement at least following mathematical operations.

1. 2D Matrix operations like Addition, Subtraction, Multiplication, Transpose

2. Solution of non-linear polynomial equations
3. Calculation of Sine, Cosine, Tangent of a given angle in degree.
4. Solution of simultaneous algebraic equations.
5. Complex number operations like, addition, subtraction, multiplication of two complex numbers, magnitude of a complex number we will implement above 6 mathematical operations in Python. This may appear difficult to you at first, but these are very simple operations and it will become simpler as we progress. To make the above points more clear, let's discuss them in detail.