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A Project Report

On

SCIENTIFIC CALCULATOR

Submitted in Partial Fulfillment of the Requirement for the Degree of Bachelor of Computer Applications

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INTRODUCTION OF THE PROJECT

The project Scientific Calculator is designed to automate the calculation procedure. Making less paper work and automate the process of calculation.

PROBLEM DEFINITION

A scientific calculator is a type of electronic calculator, usually but not always handheld, designed to calculate problems in science (especially physics),engineering, and mathematics. They have almost completely replaced slide rules in almost all 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In certain contexts such as higher education, scientific calculators have been superseded by graphing calculators, which offer a superset of scientific calculator functionality along with the ability to graph input data and write and store programs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.

Functions

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 pi and e
- In addition, high-end scientific calculators will include:
- hexadecimal, binary, and octal calculations, including basic Boolean math
- complex numbers
- fractions
- statistics and probability calculations
- programmability — see Programmable calculator
- equation solving
- calculus
- conversion of units
- physical constants

While most scientific models have traditionally used a single-line display similar to traditional pocket calculators, many of them have at the very least more digits (10 to 12), sometimes with extra digits for the floating point exponent. A few have multi-line displays, with some recent models from Hewlett-Packard,Texas Instruments, Casio, Sharp, and Canon using dot matrix displays similar to those found on graphing calculators.

Uses

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.

They are very often required for math classes from the junior high school level through college, and are generally either permitted or required on manystandardized 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 the problem on a textbook page into calculator input, from allowing explicit operator precedence using parentheses to providing a method for the user to enter an entire problem in as it is written on the page using simple formatting tools.

History

The first scientific calculator that included all of the basic features above was the programmable Hewlett-Packard HP-9100A, released in 1968, though theWang LOCI-2 and the Mathatronics Mathatron 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 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.

The HP-35, introduced on February 1, 1972, was Hewlett-Packard's first pocket calculator and the world's first handheld scientific calculator. Like some of HP's desktop calculators it used reverse Polish notation. Introduced at US$395, the HP-35 was available from 1972 to 1975. HP continues to develop and market high-end scientific calculators, like the HP-35s and HP-49 series, which have been favored by scientists and engineers, in labs, offices, as well as in the field.

Texas Instruments, after the introduction of several units with scientific notation, came out with a handheld scientific calculator on January 15, 1974 in the form of the SR-50. TI continues to be a major player in the calculator market, with their long-running TI-30 series being one of the most widely used scientific calculators in classrooms.

FEASIBILITY STUDY

A feasibility study is an evaluation of a proposal designed to determine the difficulty in carrying out a designated task. Generally, a feasibility study precedes technical development and project implementation. In other words, a feasibility study is an evaluation or analysis of the potential impact of a proposed project.

Five common factors (TELOS)

Technology and system feasibility

The assessment is based on an outline design of system requirements in terms of Input, Processes, Output, Fields, Programs, and Procedures. This can be quantified in terms of volumes of data, trends, frequency of updating, etc. in order to estimate whether the new system will perform adequately or not. Technological feasibility is carried out to determine whether the company has the capability, in terms of software, hardware, personnel and expertise, to handle the completion of the project.

Economic feasibility

Economic analysis is the most frequently used method for evaluating the effectiveness of a new system. More commonly known as cost/benefit analysis, the procedure is to determine the benefits and savings that are expected from a candidate system and compare them with costs. If benefits outweigh costs, then the decision is made to design and implement the system. An entrepreneur must accurately weigh the cost versus benefits before taking an action.

Cost Based Study: It is important to identify cost and benefit factors, which can be categorized as follows: 1. Development costs; and 2. Operating costs. This is an analysis of the costs to be incurred in the system and the benefits derivable out of the system.

Time Based Study: This is an analysis of the time required to achieve a return on investments. The benefits derived from the system. The future value of a project is also a factor.

Legal feasibility

Determines whether the proposed system conflicts with legal requirements, e.g. a data processing system must comply with the local Data Protection Acts.

Operational feasibility

Is a measure of how well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development.

Schedule feasibility

A project will fail if it takes too long to be completed before it is useful. Typically this means estimating how long the system will take to develop, and if it can be completed in a given time period using some methods like payback period. Schedule feasibility is a measure of how reasonable the project timetable is. Given our technical expertise, are the project deadlines reasonable? Some projects are initiated with specific deadlines. You need to determine whether the deadlines are mandatory or desirable...

Other feasibility factors

Market and real estate feasibility

Market Feasibility Study typically involves testing geographic locations for a real estate development project, and usually involves parcels of real estate land. Developers often conduct market studies to determine the best location within a jurisdiction, and to test alternative land uses for given parcels. Jurisdictions often require developers to complete feasibility studies before they will approve a permit application for retail, commercial, industrial, manufacturing, housing, office or mixed-use project. Market Feasibility takes into account the importance of the business in the selected area.

Resource feasibility

This involves questions such as how much time is available to build the new system, when it can be built, whether it interferes with normal business operations, type and amount of resources required, dependencies, etc. Contingency and mitigation plans should also be stated here.

Cultural feasibility

In this stage, the project's alternatives are evaluated for their impact on the local and general culture. For example, environmental factors need to be considered and these factors are to be well known. Further an enterprise's own culture can clash with the results of the project.

Output

The feasibility study outputs the feasibility study report, a report detailing the evaluation criteria, the study findings, and the recommendations.

PROPOSED SYSTEM

1. It is automated computerized web based software system.

2. It uses latest technologies like Visual Basic.

3. It is easy to operate.

4. Attractive User Interface

SYSTEM REQUIREMENTS

This Scientific Calculator can be used in Windows 98, Windows2000, Windows XP and Windows NT.

Hardware Specification

Computer

- IBM PC/AT Computer or above
- Processor
- Intel Pentium Core 2 Duo or above
- Memory
- RAM 1 GB or above
- HDD 80.0 GB or above

Software Specification

- Front End : Visual Basic 6.0
- Back End : Microsoft Access 2003

ABOUT FRONTEND

WHY VISUAL BASIC

Graphical user interfaces, or GUI has revolutionized the microcomputer industry. They demonstrate that the proverb "A picture is worth a thousand words", hasn't lost its truth to most computer users. Instead of the cryptic C :\> prompt that DOS user has long seen, we are presenting with a desktop filled with icons and with programs that use mice and menus.

For a long time there few such tools for developing Windows applications. Before Visual Basic was introduced in 1991, developing Windows applications was much harder than developing DOS applications. Programmers had too much to worry about where the user was inside a menu, and whether he or she was clicking or double clicking at a given place, developing a windows application required experts C programmers and hundreds of lines of code for the simplest task, even the experts had trouble.

Visual Basic version 6 is the newest addition to the family of VB products. It allows us to quickly & easily develop windows application for our PC without being expert in any programming language. VB provides a graphical environment in which we visually design the forms & controls that becomes the building blocks of your applications. VB supports many useful tools that will help us too more productive. These provide, but are not limited to projects, forms, class, objects, templates, custom controls, add-ins & database managers.

Visual Basic let us add menus, text boxes, command buttons, option buttons (for making exclusive choices), check boxes (for non-exclusive choices), list boxes, scroll bars, file and directory boxes to blank windows. We can use grids to handle tabular data. We can communicate with other windows applications, and perhaps most importantly, we'll have an easy method to let users' control and access databases.

We can have multiple windows on a screen. These windows have full access to the clipboard and to the information are most other windows applications running at the same time.

We can use visual basic to communicate with other applications running under windows, using the most modern version of Microsoft's COM/OLE technology.

Visual Basic provides a graphical environment in which we visually design the forms and controls that become the building blocks of our application. Visual Basic supports many useful tools that will help us to be more productive. These include, but are not limited to projects, forms, class objects, templates, custom controls, add-ins and database managers. We can use these tools together to create complete applications in months, weeks or even days, producing an application using another language can take much larger.

Version 6 of Visual Basic is specifically design to utilize the Internet. It comes with several controls that allow us to create web-based applications called ActiveX executables. These works just like standalone Visual Basic applications, but they are accessed through the Microsoft Internet explorer 4-web browser. Using this new style of application, we use revise our existing Visual Basic applications and distribute them through the internet. New to Visual Basic 6 are the ISAPI application and dynamic H1ML project templates. These templates provide us with a framework to develop server-side components as well as "Smart" Web pages and applications.

Visual Basic continues to sport the Explorer style development environment, modeled after Windows Explorer. This makes it easy for a computer user to jump right into creating applications with Visual Basic. Almost all of the objects and tools on the screen can be manipulated through a right-click. We set properties, add controls, and even view context sensitive help with this single action.

In a nutshell the answer is that Visual Basic 6 offers us more: more internet features, better support for database development, more language features to make your programming jobs easier, more wizards, more, more, and more.

Visual Basic was derived from BASIC, and is an event driven programming language. Programming in Visual Basic is done visually, which means that as you design, you will know how your application will look on execution. User can therefore,

Change and experiment with the design to meet your requirement.

Three editions of Visual Basic are available.

Standard

Professional

Enterprise

STANDARD EDITION:-

The Visual Basic Standard edition:

Allows user to create powerful 32 bit applications for Microsoft Windows 9xs and Windows NT.

Includes intrinsic controls, as well as grid, tab, and data-bound controls.

Includes Microsoft Developer Network CDs containing full online documentation.

PROFESSIONAL EDITION:-

The Professional edition, in addition to the features provided in the Standard edition, includes:

ActiveX controls, including internet control.

Internet Information Server Application Designer.

Integrated Data Tools and Data Environment.

Dynamic HTML Page Designer.

ENTERPRISE EDITION:-

The Enterprise edition, in addition to the features available in the Professional edition, allows creation of robust distributed application and includes:

Application Performance Explorer.

Internet Information Services.

Support for Microsoft Transaction Server 2.0.

Stored Procedure Editor.

SQL Debugging.

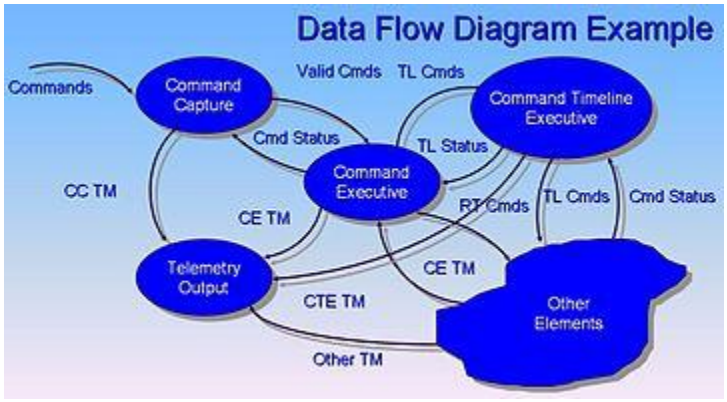
Visual Component Manager.

Visual Database Tools.

Visual SourceSafe.

DATA FLOW DIAGRAM

Data flow diagram



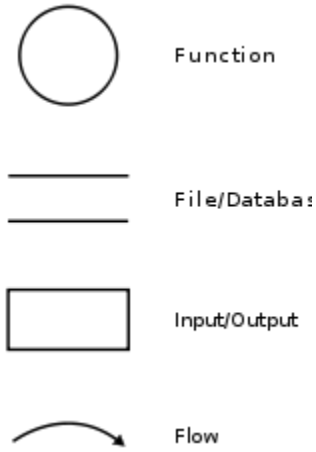
Data flow diagram example.

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modelling its *process*aspects. Often they are a preliminary step used to create an overview of the system which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design).

A DFD shows what kinds of data will be input to and output from the system, where the data will come from and go to, and where the data will be stored. It does not show information about the timing of processes, or information about whether processes will operate in sequence or in parallel (which is shown on a flowchart).

Overview

Data flow diagram example.



Data flow diagram -Yourdon/DeMarco notation.

It is common practice to draw the context-level data flow diagram first, which shows the interaction between the system and external agents which act as data sources and data sinks. On the context diagram the system's interactions with the outside world are modelled purely in terms of data flows across the *system boundary*. The context diagram shows the entire system as a single process, and gives no clues as to its internal organization.

This context-level DFD is next "exploded", to produce a Level 0 DFD that shows some of the detail of the system being modeled. The Level 0 DFD shows how the system is divided into sub-systems (processes), each of which deals with one or more of the data flows to or from an external agent, and which together provide all of the functionality of the system as a whole. It also identifies internal data stores that must be present in order for the system to do its job, and shows the flow of data between the various parts of the system.

Data flow diagrams were proposed by Larry Constantine, the original developer of structured design, based on Martin and Estrin's "data flow graph" model of computation.

Data flow diagrams (DFDs) are one of the three essential perspectives of the structured-systems analysis and design method SSADM. The sponsor of a project and the end users will need to be

briefed and consulted throughout all stages of a system's evolution. With a data flow diagram, users are able to visualize how the system will operate, what the system will accomplish, and how the system will be implemented. The old system's dataflow diagrams can be drawn up and compared with the new system's data flow diagrams to draw comparisons to implement a more efficient system. Data flow diagrams can be used to provide the end user with a physical idea of where the data they input ultimately has an effect upon the structure of the whole system from order to dispatch to report. How any system is developed can be determined through a data flow diagram.

In the course of developing a set of *levelled* data flow diagrams the analyst/designers is forced to address how the system may be decomposed into component sub-systems, and to identify the transaction data in the data model.

There are different notations to draw data flow diagrams (Yourdon & Coad and Gane & Sarson), defining different visual representations for processes, data stores, data flow, and external entities.

DATA DICTIONARY

A data dictionary, or metadata repository, as defined in the *IBM Dictionary of Computing*, is a "centralized repository of information about data such as meaning, relationships to other data, origin, usage, and format." The term may have one of several closely related meanings pertaining to databases and database management systems (DBMS):

a document describing a database or collection of databases

an integral component of a DBMS that is required to determine its structure

a piece of middleware that extends or supplants the native data dictionary of a DBMS

Documentation

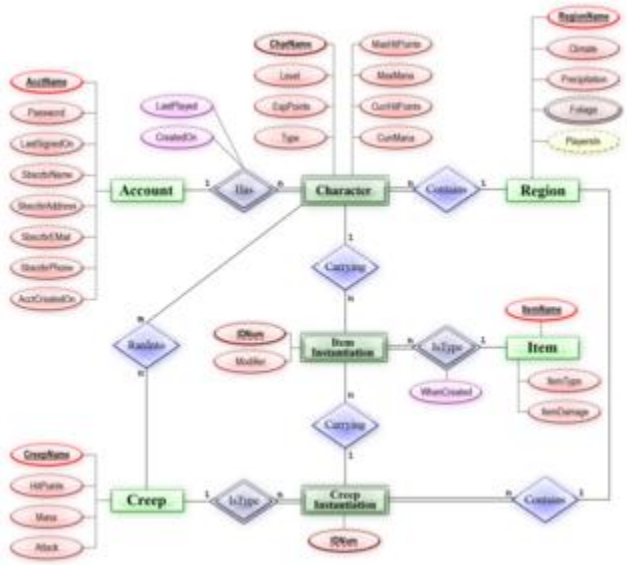
The term Data Dictionary and Data Repository are used to indicate a more general software utility than a catalogue. A Catalogue is closely coupled with the DBMS Software; it provides the information stored in it to user and the DBA, but it is mainly accessed by the various software modules of the DBMS itself, such as DDL and DML compilers, the query optimiser, the transaction processor, report generators, and the constraint enforcer. On the other hand, a Data Dictionary is a data structure that stores meta-data, i.e., data about data. The Software package for a stand-aloneData Dictionary or Data Repository may interact with the software modules of the DBMS, but it is mainly used by the Designers, Users and Administrators of a computer system for information resource management. These systems are used to maintain information on system hardware and software configuration, documentation, application and users as well as other information relevant to system administration.

If a data dictionary system is used only by the designers, users, and administrators and not by the DBMS Software , it is called a Passive Data Dictionary; otherwise, it is called an Active Data Dictionary or Data Dictionary. *An Active Data Dictionary* is automatically updated as changes occur in the database. A *Passive Data Dictionary* must be manually updated.

The data Dictionary consists of record types (tables) created in the database by systems generated command files, tailored for each supported back-end DBMS. Command files contain SQL Statements for CREATE TABLE, CREATE UNIQUE INDEX, ALTER TABLE (for referential integrity), etc., using the specific statement required by that type of database.

Database users and application developers can benefit from an authoritative data dictionary document that catalogs the organization, contents, and conventions of one or more databases. This typically includes the names and descriptions of various tables and fields in each database, plus additional details, like the type and length of each data element. There is no universal standard as to the level of detail in such a document, but it is primarily a weak kind of data.

ENTITY-RELATIONSHIP MODEL



A sample Entity-relationship diagram using Chen's notation

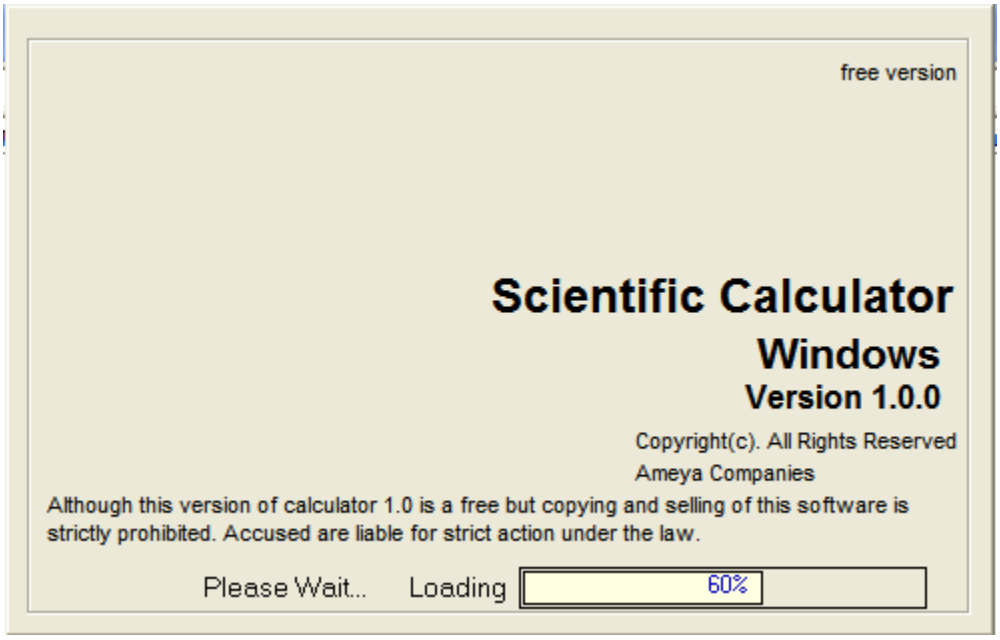
In software engineering, an entity-relationship model (ERM) is an abstract and conceptual representation of data. Entity-relationship modeling is a database modeling method, used to produce a type of conceptual schema or semantic data model of a system, often arelational database, and its requirements in a top-down fashion. Diagrams created by this process are called entity-relationship diagrams,ER diagrams, or ERDs.

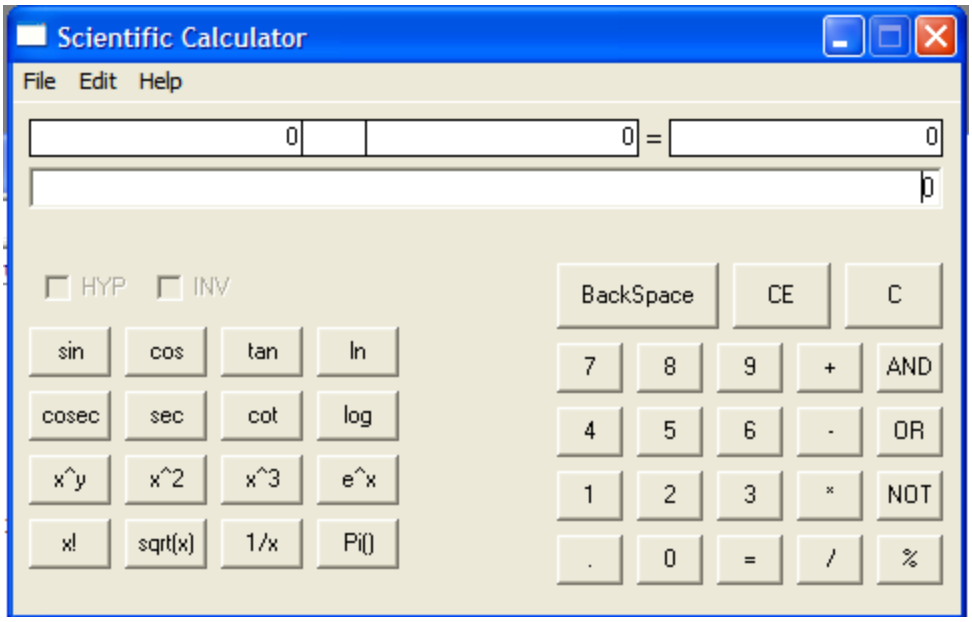
This article refers to the techniques proposed in Peter Chen's 1976 paper. However, variants of the idea existed previously, and have been devised subsequently.

Overview

The first stage of information system design uses these models during the requirements analysis to describe information needs or the type of information that is to be stored in a database. The data modeling technique can be used to describe any ontology (i.e. an overview and classifications of used terms and their relationships) for a certain area of interest. In the case of the design of an information system that is based on a database, the conceptual data model is, at a later stage (usually called logical design), mapped to a logical data model, such as the relational model; this in turn is mapped to a physical model during physical design. Note that sometimes, both of these phases are referred to as "physical design".

SYSTEM PHYSICAL DESIGN




Scientific Calculator
File Edit Help
0
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HYP
INV
BackSpace
CE
C
sin
cos
tan
ln
7
8
9
+
AND
cosec
sec
cot
log
4
5
6
-
OR
x^y
x^2
x^3
e^x
1
2
3
*
NOT
x!
sqrt(x)
1/x
Pi()
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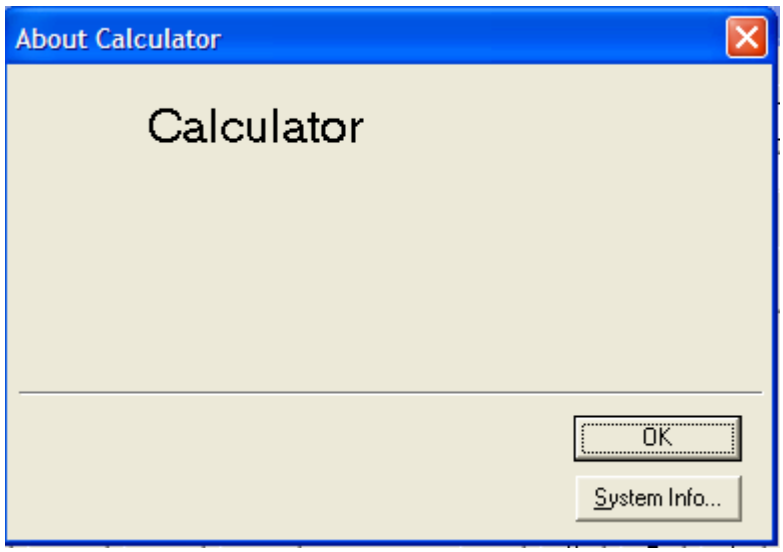
0
=
/
%


About Calculator
Calculator
OK
System Info...

CODING

Calc.frm

```
Public no1 As Double, no2 As Double, WhichNo As Boolean, Dot As Boolean, op As String, answer As Double, DotVal As Long

Sub textvalue(num As Long)
    On Error GoTo OvrFlowError
    If (Not WhichNo) Then
        If (Dot) Then
            DotVal = DotVal + 1
            temp = num
            For i = 1 To DotVal
                temp = (temp / 10)
            Next
            no1 = no1 + temp
        Else
            temp = no1 * 10
            no1 = temp + num
        End If
        Text1.Text = no1
    Else
        If (Dot) Then
            DotVal = DotVal + 1
            temp = num
            For i = 1 To DotVal
                temp = (temp / 10)
```

```
            Next
            no2 = no2 + temp
        Else
            temp = no2 * 10
            no2 = temp + num
        End If
        Text1.Text = no2
    End If
    txtNO1.Text = no1
    txtNO2.Text = no2
    txtOP.Text = op
    txtANS.Text = answer
    Exit Sub
OvrFlowError:
    MsgBox "Overflow occured!" & Chr(13) & "Please restart your job.", vbExclamation, "Error - Ameya's Calculator"
End Sub
Sub calc()
    On Error GoTo aritherror
    Select Case op
    Case "+"
        answer = (no1 + no2)
    Case "-"
        answer = (no1 - no2)
    Case "*"
```

```
    answer = (no1 * no2)
Case "/"
    answer = (no1 / no2)
Case "%"
    'answer = (no1 % no2)
Case "&"
    answer = (no1 & no2)
Case "|"
    answer = (no1 & no2)
Case "~"
    answer = (Not no1)
Case "sin"
    answer = (Sin(no1))
Case "cos"
    answer = (Cos(no1))
Case "tan"
    answer = (Tan(no1))
Case "cosec"
    answer = (1 / Sin(no1))
Case "sec"
    answer = (1 / Cos(no1))
Case "cot"
    answer = (1 / Tan(no1))
Case "ln"
    answer = (Log(no1))
```

```
    Case "log"
        answer = (Log(no1) / 2.30258509299405)
    Case "^"
        answer = (no1 ^ no2)
    Case "!"
        answer = 1
        For i = 2 To no1
            answer = answer * i
        Next
    End Select
    txtOP.Text = ""
    WhichNo = False
    Text1.Text = answer
    txtNO1.Text = no1
    txtNO2.Text = no2
    txtOP.Text = op
    txtANS.Text = answer
    no1 = answer
    Exit Sub
aritherror:
    MsgBox "Arithmetic error occured!. Possibly Overflow." & Chr(13) & "Please restart your job.", vbExclamation, "Error - Ameya's Calculator"
End Sub
Private Sub error(errorno As Long)
    Select Case errorno
```

```
    Case 1
        MsgBox "Divide by zero error!"
    Case 2
        MsgBox "Operator Overflow!"
    End Select
End Sub

Private Sub about_Click()
    frmAbout.Show
End Sub
Private Sub btn1_Click()
    textvalue (1)
End Sub

Private Sub btn2_Click()
    textvalue (2)
End Sub
Private Sub btn3_Click()
    textvalue (3)
End Sub
Private Sub btn4_Click()
    textvalue (4)
End Sub
Private Sub btn5_Click()
    textvalue (5)
```

```
End Sub
Private Sub btn6_Click()
    textvalue (6)
End Sub
Private Sub btn7_Click()
    textvalue (7)
End Sub
Private Sub btn8_Click()
    textvalue (8)
End Sub
Private Sub btn9_Click()
    textvalue (9)
End Sub
Private Sub btn0_Click()
    textvalue (0)
End Sub
Private Sub btnADD_Click()
    op = "+"
    WhichNo = True
    Text1.Text = ""
    DotVal = 0
    Dot = False
    no2 = 0
End Sub
Private Sub btnSUB_Click()
```

```
    op = "-"
    WhichNo = True
    Text1.Text = ""
    DotVal = 0
    Dot = False
    no2 = 0
End Sub
Private Sub btnMUL_Click()
    op = "*"
    WhichNo = True
    Text1.Text = ""
    DotVal = 0
    Dot = False
    no2 = 0
End Sub
Private Sub btnDIV_Click()
    op = "/"
    WhichNo = True
    Text1.Text = ""
    DotVal = 0
    Dot = False
    no2 = 0
End Sub
Private Sub btnAND_Click()
    op = "&"
```

```
    WhichNo = True
    Text1.Text = ""
    DotVal = 0
    Dot = False
End Sub
Private Sub btnOR_Click()
    op = "|"
    WhichNo = True
    Text1.Text = ""
    DotVal = 0
    Dot = False
End Sub
Private Sub btnMOD_Click()
    op = "%"
    WhichNo = True
    Text1.Text = ""
    DotVal = 0
    Dot = False
End Sub
Private Sub btnNOT_Click()
    op = "~"
    WhichNo = True
    Text1.Text = ""
    DotVal = 0
    Dot = False
```

```
    calc
End Sub
Private Sub btnSIN_Click()
    op = ""
    If (chkINV.Value = 1) Then
        op = "a"
    End If
    op = op & "sin"
    If (chkHYP.Value = 1) Then
        op = op & "h"
    End If
    DotVal = 0
    Dot = False
    calc
End Sub
Private Sub btnCOS_Click()
    op = ""
    If (chkINV.Value = 1) Then
        op = "a"
    End If
    op = op & "cos"
    If (chkHYP.Value = 1) Then
        op = op & "h"
    End If
    DotVal = 0
```

```
    Dot = False
    calc
End Sub
Private Sub btnTAN_Click()
    op = ""
    If (chkINV.Value = 1) Then
        op = "a"
    End If
    op = op & "tan"
    If (chkHYP.Value = 1) Then
        op = op & "h"
    End If
    DotVal = 0
    Dot = False
    calc
End Sub
Private Sub btnCOSEC_Click()
    op = ""
    If (chkINV.Value = 1) Then
        op = "a"
    End If
    op = op & "cosec"
    If (chkHYP.Value = 1) Then
        op = op & "h"
    End If
```

```
    DotVal = 0
    Dot = False
    calc
End Sub
Private Sub btnSEC_Click()
    op = ""
    If (chkINV.Value = 1) Then
        op = "a"
    End If
    op = op & "sec"
    If (chkHYP.Value = 1) Then
        op = op & "h"
    End If
    Text1.Text = ""
    DotVal = 0
    Dot = False
    calc
End Sub
Private Sub btnCOT_Click()
    op = ""
    If (chkINV.Value = 1) Then
        op = "a"
    End If
    op = op & "cot"
    If (chkHYP.Value = 1) Then
```

```
    op = op & "h"
  End If
  Text1.Text = ""
  DotVal = 0
  Dot = False
  calc
End Sub
Private Sub btnLN_Click()
  If (no1 <= 0) Then
    MsgBox ("logarithm is only defined for positive numbers." & Chr(13) & "Please enter a valid no and then take logarithm.")
  Else
    op = "ln"
    Text1.Text = ""
    DotVal = 0
    Dot = False
    calc
  End If
End Sub
Private Sub btnLOG_Click()
  If (no1 <= 0) Then
    MsgBox ("logarithm is only defined for positive numbers." & Chr(13) & "Please enter a valid no and then take logarithm.")
  Else
    op = "log"
    Text1.Text = ""
```

```
        DotVal = 0
        Dot = False
        calc
    End If
End Sub
Private Sub btnPOW_Click()
    op = "^"
    WhichNo = True
    Text1.Text = ""
    DotVal = 0
    Dot = False
End Sub
Private Sub btnPOW2_Click()
    op = "^"
    no2 = 2
    Text1.Text = ""
    DotVal = 0
    Dot = False
    calc
End Sub
Private Sub btnPOW3_Click()
    op = "^"
    no2 = 3
    Text1.Text = ""
    DotVal = 0
```

```
    Dot = False
    calc
End Sub
Private Sub btnINV_Click()
    op = "^"
    no2 = -1
    Text1.Text = ""
    DotVal = 0
    Dot = False
    calc
End Sub
Private Sub btnFACTORIAL_Click()
    op = "!"
    Text1.Text = ""
    DotVal = 0
    Dot = False
    calc
End Sub
Private Sub btnSQRT_Click()
    If (no1 < 0) Then
        MsgBox ("Square Root is not defined for negative numbers.")
    Else
        op = "^"
        no2 = 0.5
        Text1.Text = ""
```

```
        DotVal = 0
        Dot = False
        calc
    End If
End Sub
Private Sub btnEXP_Click()
    op = "^"
    no2 = no1
    no1 = 2.30258509299405
    Text1.Text = ""
    DotVal = 0
    Dot = False
    calc
End Sub
Private Sub btnPI_Click()
    If (Not WhichNo) Then
        no1 = 3.14159265358979
    Else
        no2 = 3.14159265358979
    End If
    Text1.Text = "3.14159265358979"
    DotVal = 0
    Dot = False
End Sub
Private Sub btnC_Click()
```

```
    no1 = 0
    no2 = 0
    answer = 0
    Text1.Text = "0"
    op = ""
    DotVal = 0
    Dot = False
    WhichNo = False
    txtNO1.Text = no1
    txtNO2.Text = no2
    txtOP.Text = op
    txtANS.Text = answer
End Sub
Private Sub btnCE_Click()
    If (temp) Then
        no1 = 0
    Else
        no2 = 0
    End If
    Text1.Text = ""
    DotVal = 0
    Dot = False
End Sub
Private Sub btnbksp_Click()
    If (Not WhichNo) Then
```

```
        If (Len(Str(no1)) > 1) Then
            no1 = FormatNumber(Left(Str(no1), Len(Text1.Text) - 1))
            Text1.Text = no1
        End If
    Else
        If (Len(Str(no2)) > 0) Then
            no2 = FormatNumber(Left(Str(no2), Len(Text1.Text) - 1))
            Text1.Text = no2
        End If
    End If
    If (DotVal > 0) Then
        DotVal = ditval - 1
    End If
    txtNO1.Text = no1
    txtNO2.Text = no2
    txtOP.Text = op
    txtANS.Text = answer
End Sub
Private Sub btnDOT_Click()
    If (Dot = False) Then
        Dot = True
        Text1.Text = Text1.Text & "."
        DotVal = 0
    End If
End Sub
```

```
Private Sub btnEqual_Click()
    calc
    no1 = answer
    WhichNo = False
    DotVal = 0
    Dot = False
End Sub
Private Sub Command2_Click()
    MsgBox ("Temp=" & Str(temp) & " No1=" & Str(no1) & " No2=" & Str(no2) & " op=" & op)
End Sub
Private Sub copy_Click()
    Clipboard.SetText (Text1.Text)
End Sub
Private Sub cut_Click()
    Clipboard.SetText (Text1.Text)
    Text1.Text = ""
End Sub
Private Sub exit_Click()
    Unload Me
End Sub
Private Sub Form_Load()
    Dim no1, no2, op, WhichNo, Dot, temp
    no1 = 0
    no2 = 0
    answer = 0
```

```
    Dot = False
    DotVal = 0
    WhichNo = False
    btnC_Click
End Sub

Private Sub helptopic_Click()
        MsgBox ("No help found." & Chr(13) & "We are SORRY for the inconvenience!")
End Sub

Private Sub Text1_KeyUp(KeyCode As Integer, Shift As Integer)
    If (IsNumeric(Text1.Text)) Then
        If (Not WhichNo) Then
            no1 = FormatNumber(Text1.Text)
        Else
            no2 = FormatNumber(Text1.Text)
        End If
    End If
    txtNO1.Text = no1
    txtNO2.Text = no2
    txtOP.Text = op
    txtANS.Text = answer
End Sub
```

Frmabout.frm

```
Option Explicit
' Reg Key Security Options...
Const READ_CONTROL = &H20000
Const KEY_QUERY_VALUE = &H1
Const KEY_SET_VALUE = &H2
Const KEY_CREATE_SUB_KEY = &H4
Const KEY_ENUMERATE_SUB_KEYS = &H8
Const KEY_NOTIFY = &H10
Const KEY_CREATE_LINK = &H20
Const KEY_ALL_ACCESS = KEY_QUERY_VALUE + KEY_SET_VALUE + _
                KEY_CREATE_SUB_KEY + KEY_ENUMERATE_SUB_KEYS + _
                KEY_NOTIFY + KEY_CREATE_LINK + READ_CONTROL

' Reg Key ROOT Types...
Const HKEY_LOCAL_MACHINE = &H80000002
Const ERROR_SUCCESS = 0
Const REG_SZ = 1                        ' Unicode nul terminated string
Const REG_DWORD = 4                     ' 32-bit number

Const gREGKEYSYSINFOLOC = "SOFTWARE\Microsoft\Shared Tools Location"
Const gREGVALSYSINFOLOC = "MSINFO"
Const gREGKEYSYSINFO = "SOFTWARE\Microsoft\Shared Tools\MSINFO"
Const gREGVALSYSINFO = "PATH"
```

```
Private Declare Function RegOpenKeyEx Lib "advapi32" Alias "RegOpenKeyExA" (ByVal hKey As Long, ByVal lpSubKey As String, ByVal ulOptions As Long, ByVal samDesired As Long, ByRef phkResult As Long) As Long

Private Declare Function RegQueryValueEx Lib "advapi32" Alias "RegQueryValueExA" (ByVal hKey As Long, ByVal lpValueName As String, ByVal lpReserved As Long, ByRef lpType As Long, ByVal lpData As String, ByRef lpcbData As Long) As Long

Private Declare Function RegCloseKey Lib "advapi32" (ByVal hKey As Long) As Long



Private Sub cmdSysInfo_Click()

  Call StartSysInfo

End Sub


Private Sub cmdOK_Click()

  Unload Me

End Sub


Private Sub Form_Load()

    Me.Caption = "About " & App.Title

    'lblVersion.Caption = "Version " & App.Major & "." & App.Minor & "." & App.Revision

    lblTitle.Caption = App.Title

End Sub


Public Sub StartSysInfo()

    On Error GoTo SysInfoErr


    Dim rc As Long
```

```
    Dim SysInfoPath As String


    ' Try To Get System Info Program Path\Name From Registry...
    If GetKeyValue(HKEY_LOCAL_MACHINE, gREGKEYSYSINFO, gREGVALSYSINFO, SysInfoPath) Then
    ' Try To Get System Info Program Path Only From Registry...
    ElseIf GetKeyValue(HKEY_LOCAL_MACHINE, gREGKEYSYSINFOLOC, gREGVALSYSINFOLOC, SysInfoPath) Then
        ' Validate Existance Of Known 32 Bit File Version
        If (Dir(SysInfoPath & "\MSINFO32.EXE") <> "") Then
            SysInfoPath = SysInfoPath & "\MSINFO32.EXE"


        ' Error - File Can Not Be Found...
        Else
            GoTo SysInfoErr
        End If
    ' Error - Registry Entry Can Not Be Found...
    Else
        GoTo SysInfoErr
    End If


    Call Shell(SysInfoPath, vbNormalFocus)


    Exit Sub
SysInfoErr:
    MsgBox "System Information Is Unavailable At This Time", vbOKOnly
```

```
End Sub


Public Function GetKeyValue(KeyRoot As Long, KeyName As String, SubKeyRef As String, ByRef KeyVal As String) As Boolean
    Dim i As Long                           ' Loop Counter
    Dim rc As Long                          ' Return Code
    Dim hKey As Long                        ' Handle To An Open Registry Key
    Dim hDepth As Long                      '
    Dim KeyValType As Long                  ' Data Type Of A Registry Key
    Dim tmpVal As String                    ' Tempory Storage For A Registry Key Value
    Dim KeyValSize As Long                  ' Size Of Registry Key Variable
    '------------------------------------------------------------
    ' Open RegKey Under KeyRoot {HKEY_LOCAL_MACHINE...}
    '------------------------------------------------------------
    rc = RegOpenKeyEx(KeyRoot, KeyName, 0, KEY_ALL_ACCESS, hKey) ' Open Registry Key


    If (rc <> ERROR_SUCCESS) Then GoTo GetKeyError          ' Handle Error...


    tmpVal = String$(1024, 0)                   ' Allocate Variable Space
    KeyValSize = 1024                           ' Mark Variable Size


    '------------------------------------------------------------
    ' Retrieve Registry Key Value...
    '------------------------------------------------------------
    rc = RegQueryValueEx(hKey, SubKeyRef, 0, _
```

```
                KeyValType, tmpVal, KeyValSize)    ' Get/Create Key Value

If (rc <> ERROR_SUCCESS) Then GoTo GetKeyError          ' Handle Errors

If (Asc(Mid(tmpVal, KeyValSize, 1)) = 0) Then           ' Win95 Adds Null Terminated String...
   tmpVal = Left(tmpVal, KeyValSize - 1)                ' Null Found, Extract From String
Else                                                    ' WinNT Does NOT Null Terminate String...
   tmpVal = Left(tmpVal, KeyValSize)                    ' Null Not Found, Extract String Only
End If
'-------------------------------------------------------------
' Determine Key Value Type For Conversion...
'-------------------------------------------------------------
Select Case KeyValType                                  ' Search Data Types...
Case REG_SZ                                             ' String Registry Key Data Type
   KeyVal = tmpVal                                      ' Copy String Value
Case REG_DWORD                                          ' Double Word Registry Key Data Type
   For i = Len(tmpVal) To 1 Step -1                     ' Convert Each Bit
      KeyVal = KeyVal + Hex(Asc(Mid(tmpVal, i, 1)))   ' Build Value Char. By Char.
   Next
   KeyVal = Format$("&h" + KeyVal)                      ' Convert Double Word To String
End Select

GetKeyValue = True                                      ' Return Success
rc = RegCloseKey(hKey)                                  ' Close Registry Key
Exit Function                                           ' Exit
```

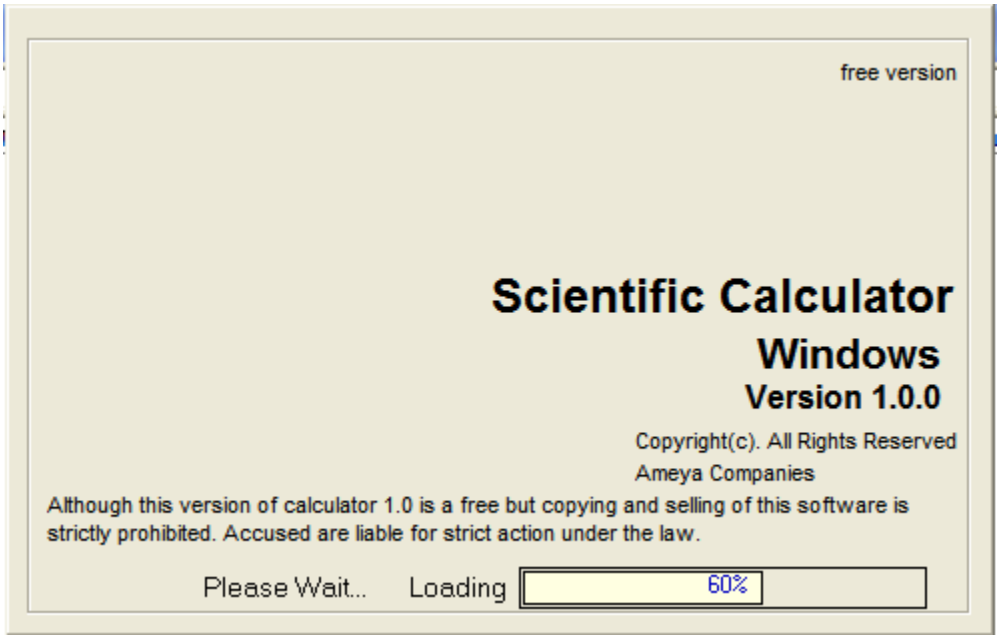
```
GetKeyError:      ' Cleanup After An Error Has Occured...
   KeyVal = ""                                ' Set Return Val To Empty String
   GetKeyValue = False                        ' Return Failure
   rc = RegCloseKey(hKey)                     ' Close Registry Key
End Function
```

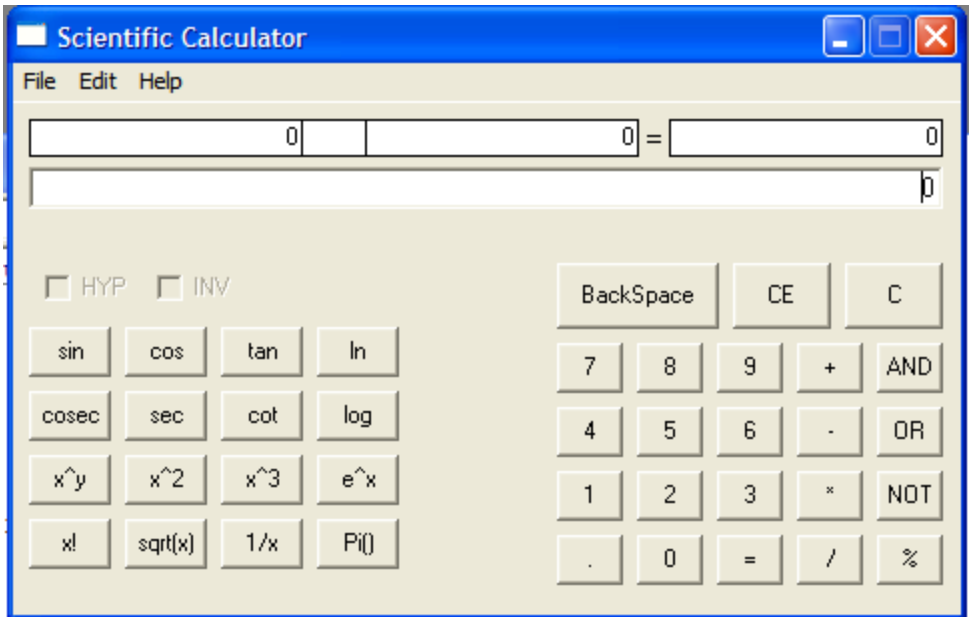
FRMSPLASH.FRM

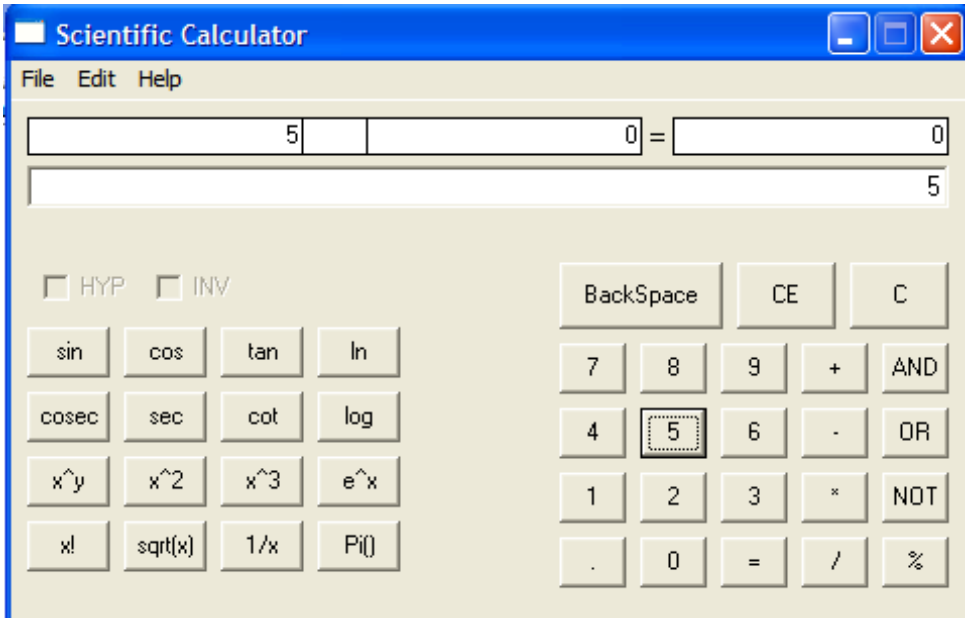
```
Option Explicit
Public i As Long

Private Sub Form_KeyPress(KeyAscii As Integer)
    Unload Me
End Sub

Private Sub Form_Load()
    i = 0
    lblVersion.Caption = "Version " & App.Major & "." & App.Minor & "." & App.Revision
    'lblProductName.Caption = App.Title
    Form1.Show
End Sub

Private Sub Frame1_Click()
    Unload Me
End Sub

Private Sub Text1_Change()

End Sub

Private Sub lblCompanyProduct_Click()
```

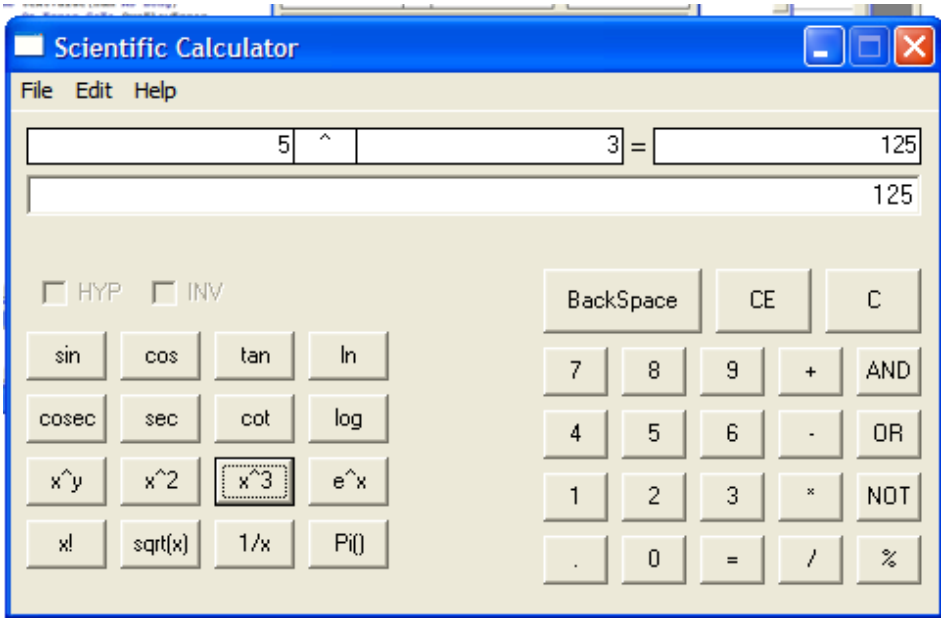
```
End Sub


Private Sub Timer1_Timer()
    If (i < 10) Then
        i = i + 1
        Shape1.Width = (i) * 300
        Label2.Caption = Str(((i + 1) * 10) - 10) & "%"
    End If
    If (i >= 10) Then
        i = i + 1
    End If
    If (i > 20) Then
        Unload Me
    End If
End Sub
```

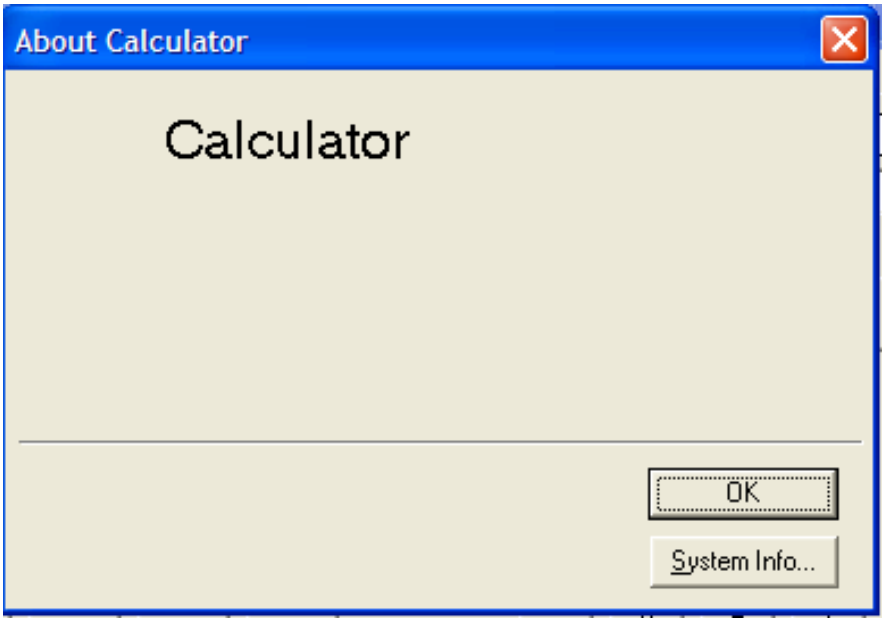
INPUT/OUTPUT SCREEN




Scientific Calculator
File Edit Help
0
0
=
0
0
HYP
INV
BackSpace
CE
C
sin
cos
tan
ln
7
8
9
+
AND
cosec
sec
cot
log
4
5
6
-
OR
x^y
x^2
x^3
e^x
1
2
3
*
NOT
x!
sqrt(x)
1/x
Pi()
.
0
=
/
%


Scientific Calculator
File Edit Help
5
0
=
0
5
HYP
INV
BackSpace
CE
C
sin
cos
tan
ln
7
8
9
+
AND
cosec
sec
cot
log
4
5
6
-
OR
x^y
x^2
x^3
e^x
1
2
3
*
NOT
x!
sqrt(x)
1/x
Pi()
.
0
=
/
%


Scientific Calculator
File Edit Help
5 ^ 3 = 125
125
HYP INV
BackSpace CE C
sin cos tan ln
cosec sec cot log
x^y x^2 x^3 e^x
x! sqrt(x) 1/x Pi()
7 8 9 + AND
4 5 6 - OR
1 2 3 * NOT
. 0 = / %


About Calculator
Calculator
OK
System Info...

SYSTEM TESTING

System testing of software or hardware is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing falls within the scope of black box testing, and as such, should require no knowledge of the inner design of the code or logic.

As a rule, system testing takes, as its input, all of the "integrated" software components that have successfully passed integration testing and also the software system itself integrated with any applicable hardware system(s). The purpose of integration testing is to detect any inconsistencies between the software units that are integrated together (called *assemblages*) or between any of the *assemblages* and the hardware. System testing is a more limited type of testing; it seeks to detect defects both within the "inter-assemblages" and also within the system as a whole.

Testing the whole system

System testing is performed on the entire system in the context of a Functional Requirement Specification(s) (FRS) and/or a System Requirement Specification (SRS). System testing tests not only the design, but also the behaviour and even the believed expectations of the customer. It is also intended to test up to and beyond the bounds defined in the software/hardware requirements specification(s).

Types of tests to include in system testing

The following examples are different types of testing that should be considered during System testing:

- Graphical user interface testing
- Usability testing
- Performance testing
- Compatibility testing
- Error handling testing
- Load testing
- Volume testing
- Stress testing
- Security testing
- Scalability testing
- Sanity testing
- Smoke testing
- Exploratory testing
- Ad hoc testing
- Regression testing

- Reliability testing
- Installation testing
- Maintenance testing
- Recovery testing and failover testing.

Accessibility testing, including compliance with:

Americans with Disabilities Act of 1990

Section 508 Amendment to the Rehabilitation Act of 1973

Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C)

IMPLEMENTATION

This system is implemented on one levels

- Direct functioning to the application.

LIMITATION AND FUTURE SCOPE

This software has limited functionality like

- Single user
- Cannot be implemented on networks.
- No login screens.

This software has lots of future scope like

- Multi user
- Implementation on network

BIBLIOGRAPHY

- Mastering Visual Basic.
- Black Book of Visual Basic Programming.
- ADO reference from www.msdn.microsoft.com