Software-Based Visual Loan Calculator For Banking Industry

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Abstract

The use of Visual Loan calculator for banking industry is very necessary in modern day banking system using many design techniques for security reasons. This paper thus presents the software-based design and implementation of a Visual Loan calculator for banking industry using Visual Basic .Net (VB.Net). The fundamental approach to this is to develop a Graphical User Interface (GUI) using VB.Net operating tools, and then developing a working program which calculates the interest of any loan obtained. The VB.Net programming was done, implemented and the software proved satisfactory.

Keywords: Principal, rate, simple interest, time, Visual Basic .Net

1.0 Introduction

Visual Loan calculator is a software used for solving the problem of getting interests accrued from loans in banks, cooperative societies and other financial institutions. In this paper, the loan calculator was designed in Visual Studio. Visual Studio is an Integrated Development Environment (IDE), providing a single interface for any number of languages, including Visual Basic [1]. The purpose of an IDE is to combine the editing, debugging, and compiling components of software development into a single interface for a programmer [2].

Just like the Visual C#, Visual C++, Visual Web Developer, etc, Visual Basic is also contained in the Visual Studio package. Visual Basic (VB) includes VB 1.0 up to Visual basic.Net (VB.Net). The .Net is from VB 7.0 upwards, and represents the entire range of VB technology and concepts that form a platform on which you can develop applications [3].

This paper however analyzes the design and implementation of a visual loan calculator which is capable of solving Simple interest problems using VB.Net.

The loan interest is obtained from the general formula for calculating Simple Interest (SI), which is:

$$SI = \{Principal\ (P)\ x\ Time\ (T)\ x\ Rate\ (R)\}\ /100 \quad \ldots\ldots (1)$$

Where:
SI = The interest sum accrued from the money borrowed
P = Amount borrowed or being owed as loan
T = Duration of payment (usually in months)
R = The interest rate chargeable by the financial institution (usually in percentage).

There are two major operating tools for software development using Visual Basic .Net. They are the Toolbox and the Properties. Toolbox is grouped into classes, namely: All Windows Form, Common Controls, Containers, Menus & Toolbars, Data, Components, Printing, Dialogs, WPF Interoperability, Reporting, and General. While Properties have Accessibility, Appearance, Behavior, Data, Design, Focus, Layout, Misc, and Window Style [4].

The design approach used in this paper is developing a Graphical User Interface (GUI) using VB.Net operating tools and then writing a program which calculates the Simple Interest.

2.0 Methodology

The layout format of the design is as explained below:
1) Launch your Visual Studio. At the bottom of the screen, there are two buttons: "Create
    Project" and "Open Project". To start the design, click on "Create Project".
2) Enter the file name and click on the OK button. The Visual Basic.Net design time environment will open. This environment, shown in Fig. 1, is a Graphical User Interface (GUI) called the "FORM".
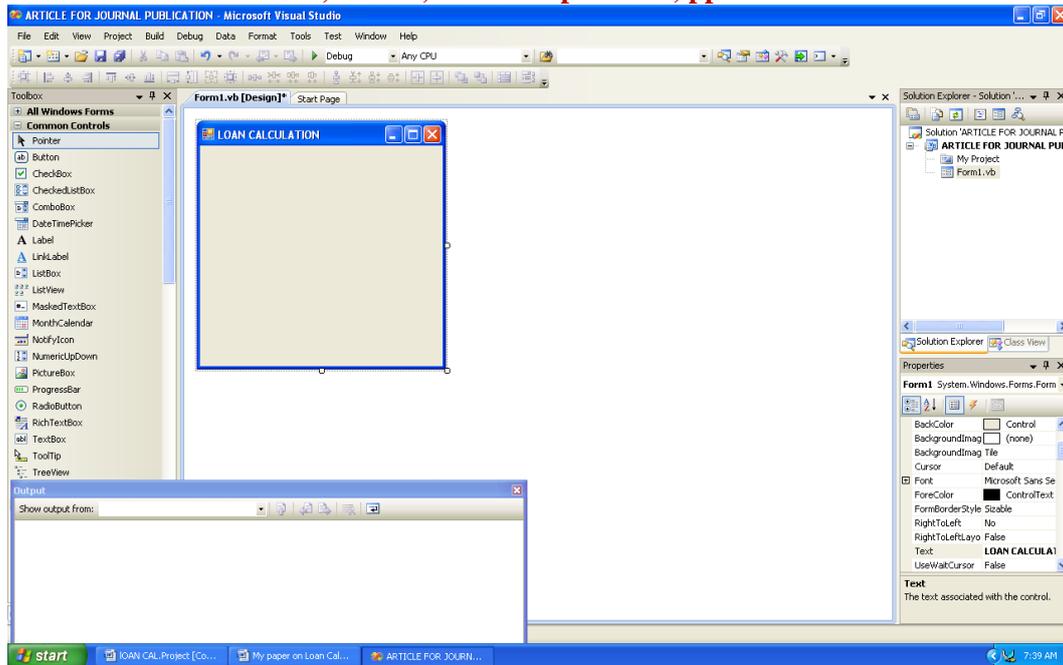
Fig. 1: The GUI of the visual studio

3) Change the colour of the background in the Properties

4) At the Properties, change the "FORM" to "LOAN CALCULATOR"

5) Click inside the FORM for the number 3 to appear

6) Drag Label and drop inside the form

7) On the Properties Text, call it "Principal"

8) Click on the Principal and right click to get the copy of it. Drop it below and change the name at the
   properties from "Principal" to "Time"

9) Do as in number 8 to get "Rate"

10) Do as in number 8 to get "Simple interest"

11) Do as in number 8 to get "Total"

12) Drag and drop Textbox near the Principal. Change the name at the Properties Name to "prin"

13) Do for the Time as in number 12 to get "tim"

14) Do for the Rate as in number 12 to get "rat"

15) Do for the Simple interest as in number 12 to get "Si"

16) Do for the Total as in number 12 to get "tot"

17) Drag and drop Button for program execution and change the Property Text to "S/I". Change the
    Property Name to "tsi". Since the overall program will be executed in the S/I button, double click on
    this button in order to write the overall program on the page that opens

18) Drag and drop Button for the total so that the total will be executed when the button is pressed. This
    total is SI + Principal. This button's name is "ttotal"

19) Do as in number 18 to get the Clear button so that your values can be cleared. Name this button at the Property name "bclear".

The Toolbox is located at the left hand side of the screen, while the Properties are found at the right hand side.

2.1 Common Controls in the Toolbox used in this Design

Button: This is used to raise an event when a user clicks on it. It is used for writing most programs. In this paper, it was used to design the keys for S/I, Total and Clear buttons.

TextBox: It enables the user to enter text, and provides multiline editing and password character masking. Cursor can be placed here. It was used in the design of the display boxes for the Principal, Time, Rate, Simple Interest and Total display.

Label: It provides run-time information or descriptive text for a control. It is used for writing or labeling items in the form environment [5]. If this control is used, data on it cannot be tampered because it has no cursor inside it, unlike the textbox. It was used in this design for writing text inside the "FORM".

2.2 Property Tools used in this Design

Some Property tools of the Visual Studio package were used in this design. Fig. 2 shows some of these tools.
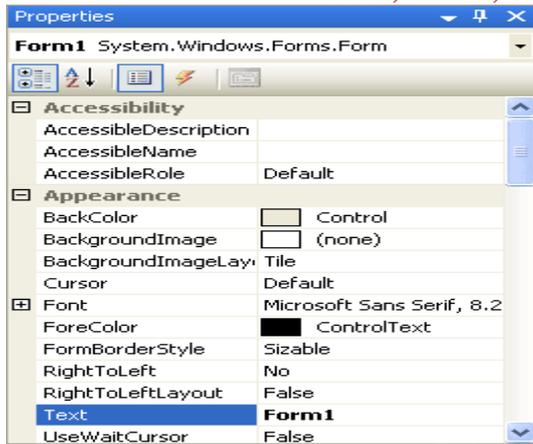
Fig. 2: The Property tools of the Visual Studio

<u>Text</u>: This was used in this design to give a name to the keys

<u>BackColour</u>: It was used to give colour background to the design.

<u>Name</u>: This was used to give a "Programming name to the keys".

<u>ForeColour</u>: This property was used to change the colour of the font in the "FORM".

The layout design is called the form 1.vb (design). To design this loan calculator, consider that there will be "SI" button, "Total" button, and "Clear" button. There will also be a "Display" TextBox for the Principal, "Display" TextBox for the Time, "Display" TextBox for the Rate, "Display"

TextBox for the Simple Interest and "Display" TextBox for the Total.

3.0 Program Development for the Loan Calculator

The code for an individual button operation is written "behind" that button, and usually appears on the form 1.Vb. The functions of the buttons are as follows:

"SI" Button: This will contain the entire output program, such that when clicked, the result of the Simple Interest will be displayed on the Display TextBox for the Simple Interest.

"Total" Button: This button contains the program for the summation of the values of the Simple Interest and that of the Principal. The total summation value is to be displayed on the Display TextBox for Total.

"Clear" Button: This button contains the program that is used to clear the values which appear in all the Display TextBoxes. The button contains the program for this clearance, plus the codes that will position the cursor on the Display TextBox for the Principal.

Double clicking any of the buttons, opens the code window. This is where the VB. Net program was written. Fig. 3 shows this programming environment.
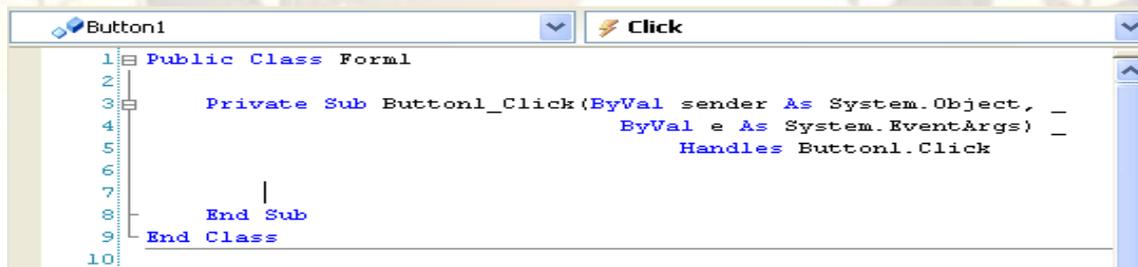
Fig. 3: The Code Window of Visual Basic .Net

To see what the design looks like (running it as a program), click Debug from the menu bar or press F5 on your keyboard.

To stop the program from running, perform the following:

1. Click the Red X at the top right of your Form
2. Click Debug > Stop Debugging from the menu bar
3. Press Shift + F5 on your keyboard

3.1 The Flowchart Design

Start

Input the value of Principal "P"

Input the value of Time "T"

Input the value of Rate "R"

$$Si = (P \times T \times R)/100$$

Total = P + Si

Is "clear" button pressed? — Yes → Clear P, T, R, Si and Total

No

Stop
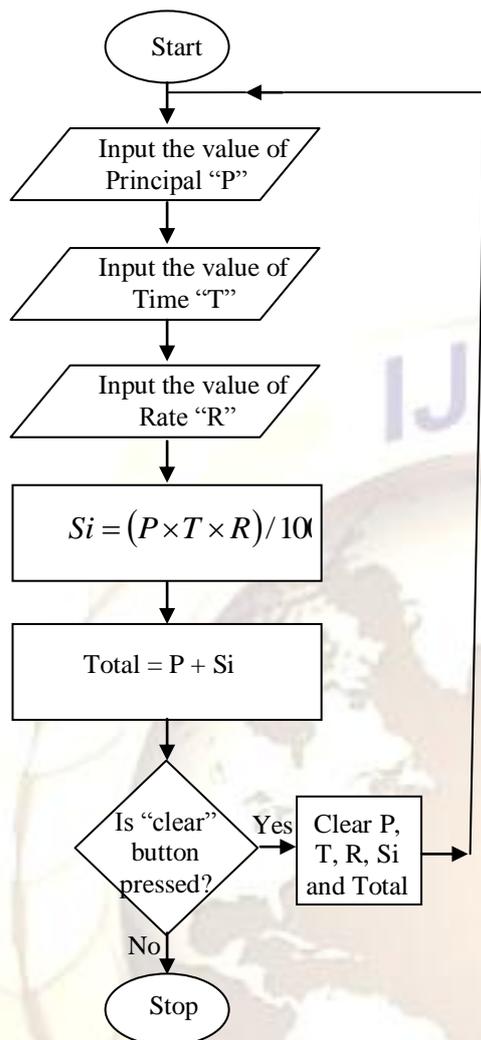
Fig. 4: Operational flowchart for the

3.2 The Developed Program

```
Public Class Form1
  Private Sub si_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs)
Handles si.Click
    Dim prin, tim, rat, si As Double
    prin = principal.Text
    tim = time.Text
    rat = rate.Text
    si = (prin * tim * rat) / 100
    tsi.Text = si
  End Sub
```

```
  Private Sub Button2_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs)
Handles Button2.Click
    Dim prin, si, tot As Double
    prin = principal.Text
    si = tsi.Text
    tot = prin + si
    ttotal.Text = tot
  End Sub
```

```
  Private Sub Button3_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs)
Handles bclear.Click
    principal.Clear()
    rate.Clear()
    time.Clear()
    tsi.Clear()
    ttotal.Clear()
    principal.Focus()
  End Sub
End Class
```

4.0 Software Implementation

This software must be implemented in a computer with Windows Operating System, because VB.Net is a Windows-based software [6]. The implementation of this software is shown in Fig. 5 below.

Just install this loan calculator software in a computer with Windows Operating System. Then enter the loan amount which the customer wants (as Principal) on the Textbox for the "Principal". This is called the Principal sum. Enter the duration for the payment on the Textbox for the "Time". This is usually in months. Enter the rate at which the interest is to be given on the Textbox for the "Rate". Click on the S/I button to display the interest on the Textbox for the "Simple interest".

To get the total amount which the customer will pay (i.e. Simple interest + the Principal), click on the "Total" button. This total amount will be displayed on the Textbox for the "Total".

The whole values can be cleared using "Clear" button; and the software was designed in such a way that after clearing all the values, the cursor will be placed on the Textbox for the "Principal", expecting another input for another customer.
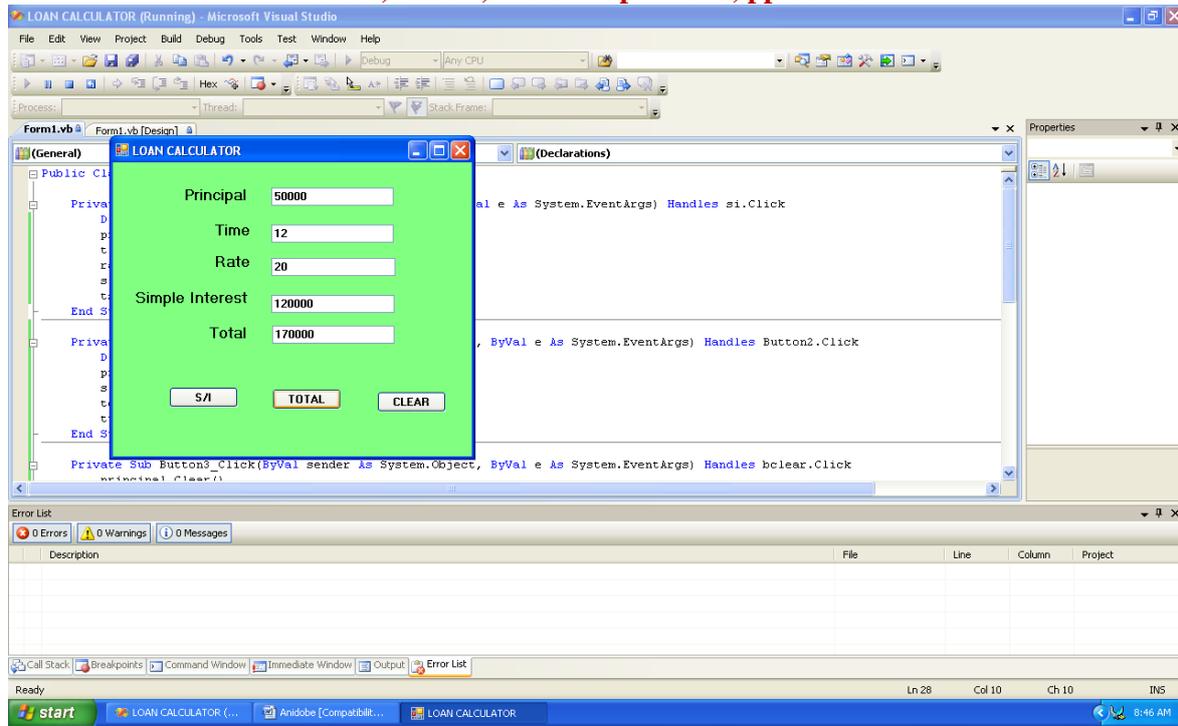
Fig. 5: System implementation

5.0 Conclusion

This software has been successfully developed to take care of the modern loan calculation for customers wishing to obtain loans from banks and other financial institutions. The good aspect of this software is its simplicity and reliability. The program was developed in VB.Net which is for Windows-based application. However, the software was error-free when tested and its implementation was successful.

The software is very good in calculating the interest of a customer's loan in a bank. It can also be applied in the area of getting the overall amount a customer will pay as Principal in the following month. This software is highly recommended for use in banks to calculate loan interests, though in a distributed node network.

References

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