VISUAL BASIC II

CC111
INTRODUCTION TO COMPUTERS

Intended Learning Objectives

- Able to build a simple Visual Basic Application.

The Sub Statement

```
Private Sub ControlName_eventName(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles ControlName.eventName`

End Sub
```

Where

Private is the default procedure type
Sub indicates beginning of procedure
controlname is name of associated control
_ (underscore) required separator
eventname is name of corresponding event
( ) set of parentheses is required
End Sub indicates end of a procedure

Example on the Sub Statement

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal
e As System.EventArgs) Handles Button1.Click
    Const pi = 3.14
    Dim r As Integer
    Dim area As Double
    r = Val(TextBox1.Text)
    area = pi * r * r
    Label3.Text = Str(area)
End Sub
```

Declarations, Variables, and Constants

Variable - a uniquely named storage location that contains data that changes during program execution

Constant - a uniquely named storage locations that contains data that does not change during program execution

Declarations, Variables, and Constants

Rules for Naming Variables

- Must begin with an alphabetic character
- Can not contain a period (.)or type-declaration characters such as
  %, &, !, #, @ or $
- Must be unique with same scope
- Must be no longer than 255 characters
- Should not be a reserved word

salary

sal ary

x$

salary4

Declaring Variables

Declaration statement – non executable code that sets aside storage locations for future use

Local variables - declared within a procedure or function

Global variables - declared in the general section of the application

Declaring Variables….

- Declare variables using the Dim statements

Dim statement - value of variable preserved only until procedure ends

Dim *variablename* **As** *datatype*

The Dim Statement

Dim *variablename* **As** *datatype*

Where

Dim is required
variablename should be a descriptive name
As is required
datatype is one of the following types:
Boolean, Byte, Date, Integer, Long,
Single, Double, Currency, String, Object or Variant

```
Dim x As Integer
```

Declaring Variables

Data Types

- **Boolean** - True or false
- **Date** - From Jan 1, 100 to Dec 31, 9999
- **Integer** - Numbers without a decimal point
- **Long** - Long integer
- **Single** - Numbers with a decimal point
- **Double** - Long Single
- **Currency** - Dollar amounts
- **String** - Character and alphanumeric data
- **Object** - Any object reference such as Word document
- **Variant** - default, can hold any data type

Assigning Values to Variables

Variablename = *value*

Where

variablename is the descriptive name of the variable
= is the assignment operator
value i the value the variable will contain

Examples:

```
Number1 = 5
FirstName = "Steve"
Length = 17.8
```

Note: Order is important. Variable name always on the left, and value on the right.

Variables can be declared and initialized in the same line:
Ex::Dim x As Integer=12

Declaring Constants

Const *constantname* **As** *datatype* = *value*

Where

Const is required
constantname is the descriptive name of the constant
As is required
datatype is the type of data the constant will contain
= is the assignment operator
value is the value of the constant

Examples:

```
Const Pi As Single = 3.14159265358979
Const MaxNumber As Integer = 100
```

Functions

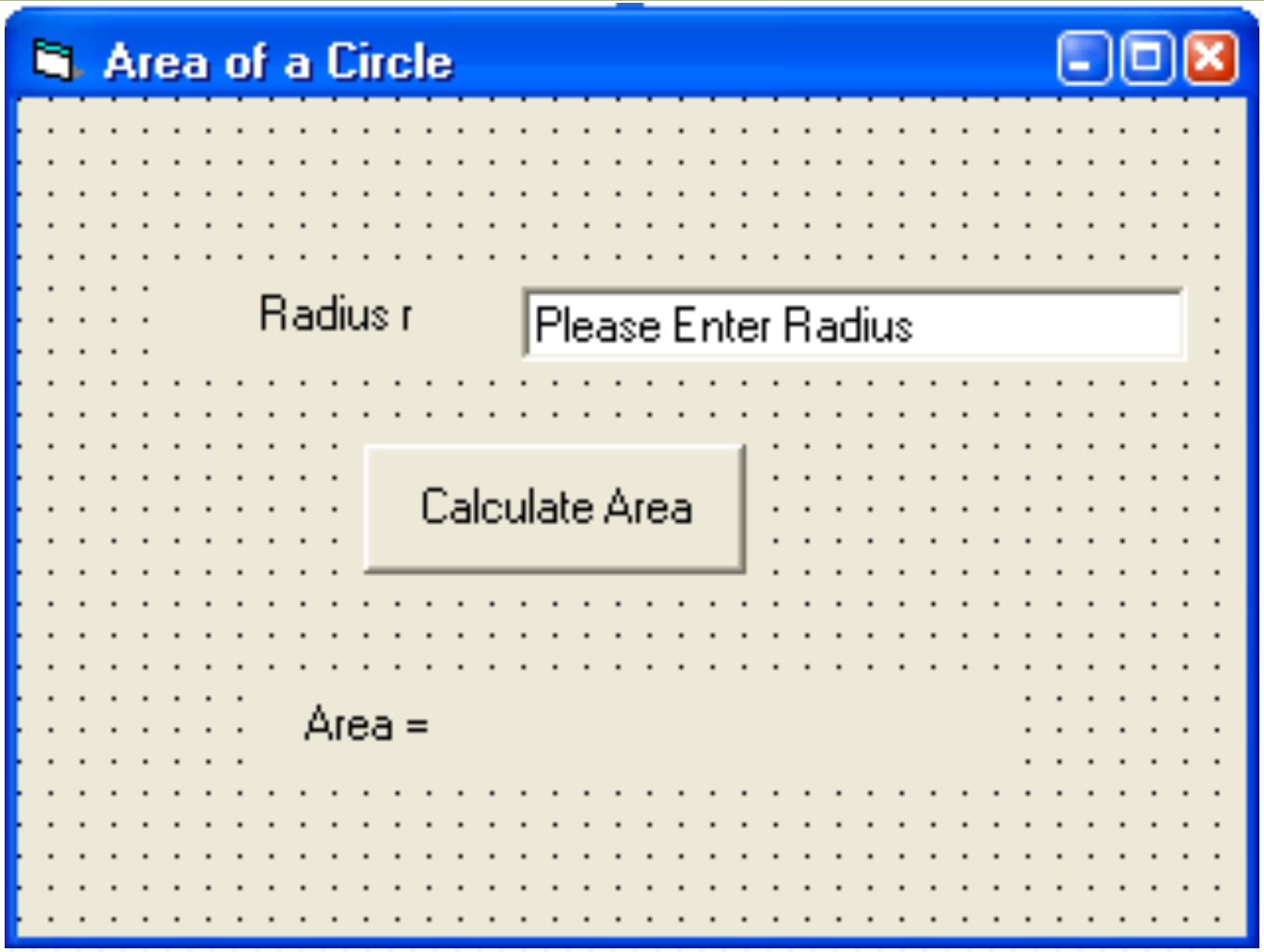
- Function - unit of code that returns a value
- Built-in Functions
  - Math.Sqrt - square root
  - Rnd - random number generator
  - Int - returns integer portion of a number
  - Val - converts a string to a value
  - Str - converts a value to a string

Application 1: Calculate the area of a circle

- Inputs: radius of the circle r
- Output: area of the circle

- Process: Area= πr^2

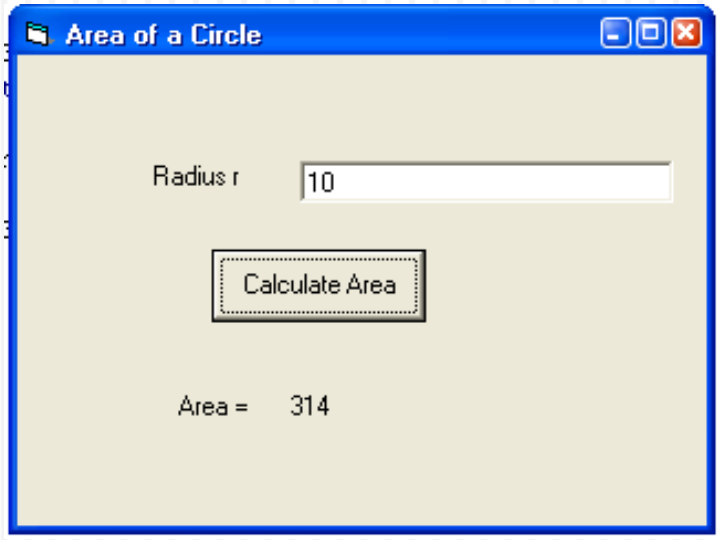
Application 1: Calculate the area of a circle (Form View)



Application 1: Calculate the area of a circle (Code View)

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button1.Click
        Const pi  As Double= 3.14
        Dim r As Integer
        Dim area As Double
        r = Val(TextBox1.Text)
        area = pi * r * r
        Label3.Text = Str(area)
    End Sub
```

Application 1: Calculate the area of a circle (Run)



Precedence Table

Operator
( )
^
*, /
+,-

If precedence of two following operators is equal, then the evaluation starts from left to right.

Simple Examples of Equations

- Equation in normal form:
  1. Y=3X
  2. Y=X-10+3(X-Z)
  3. Y= $\sqrt{X}$

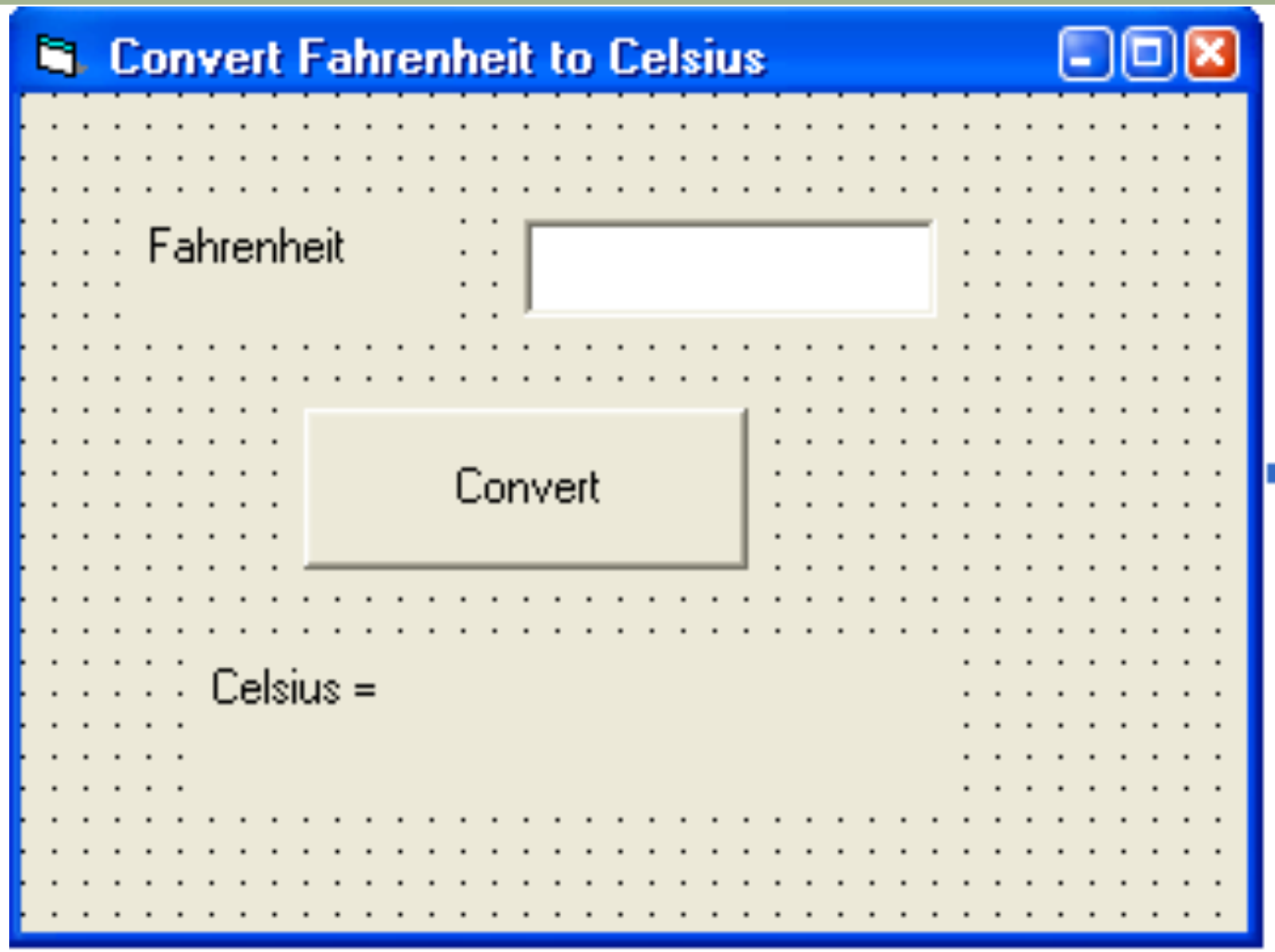
- Equation in VB form:
  1. Y=3*X
  2. Y=X-10+3*(X-Z)
  3. Y=Math.Sqrt(X)

Application 2: Convert from Fahrenheit Degree to Celsius

- Original formula: Celsius=5/9 (Fahrenheit - 32)
- Visual Basic formula: Celsius=5/9*(Fahrenheit-32)
- Input: Fahrenheit
- Output: Celsius
- Process: Celsius=5/9*(Fahrenheit-32)

Application 2

Convert from Fahrenheit Degree to Celsius (Form View)



Application 2

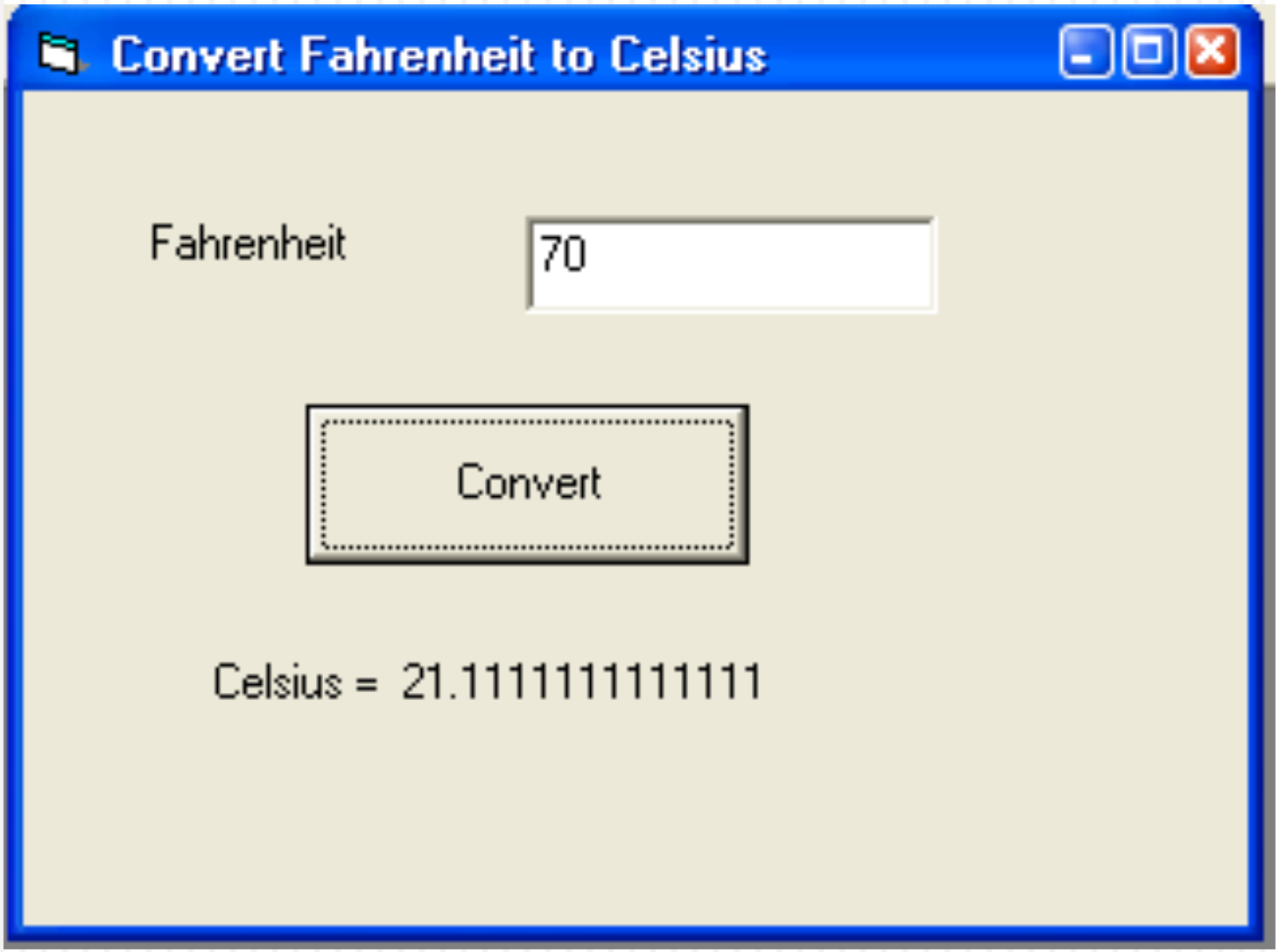
Convert from Fahrenheit Degree to Celsius (Code View)

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button1.Click
        Dim f As Double
        Dim c As Double
        f = Val(TextBox1.Text)
        c = 5 / 9 * (f - 32)
        Label2.Text = "Celsius=" + Str(c)
    End Sub
```

Note:

The + operator is used to concatenate strings

Application 2
Convert from Fahrenheit Degree to Celsius (Run)



Application 3
The Wind Chill Application

- Write a program that calculates the wind chill temperature
- Inputs: Wind Speed and Temperature
- Outputs: Wind Chill Temperature

Application 3
The Wind Chill Application

- Original formula

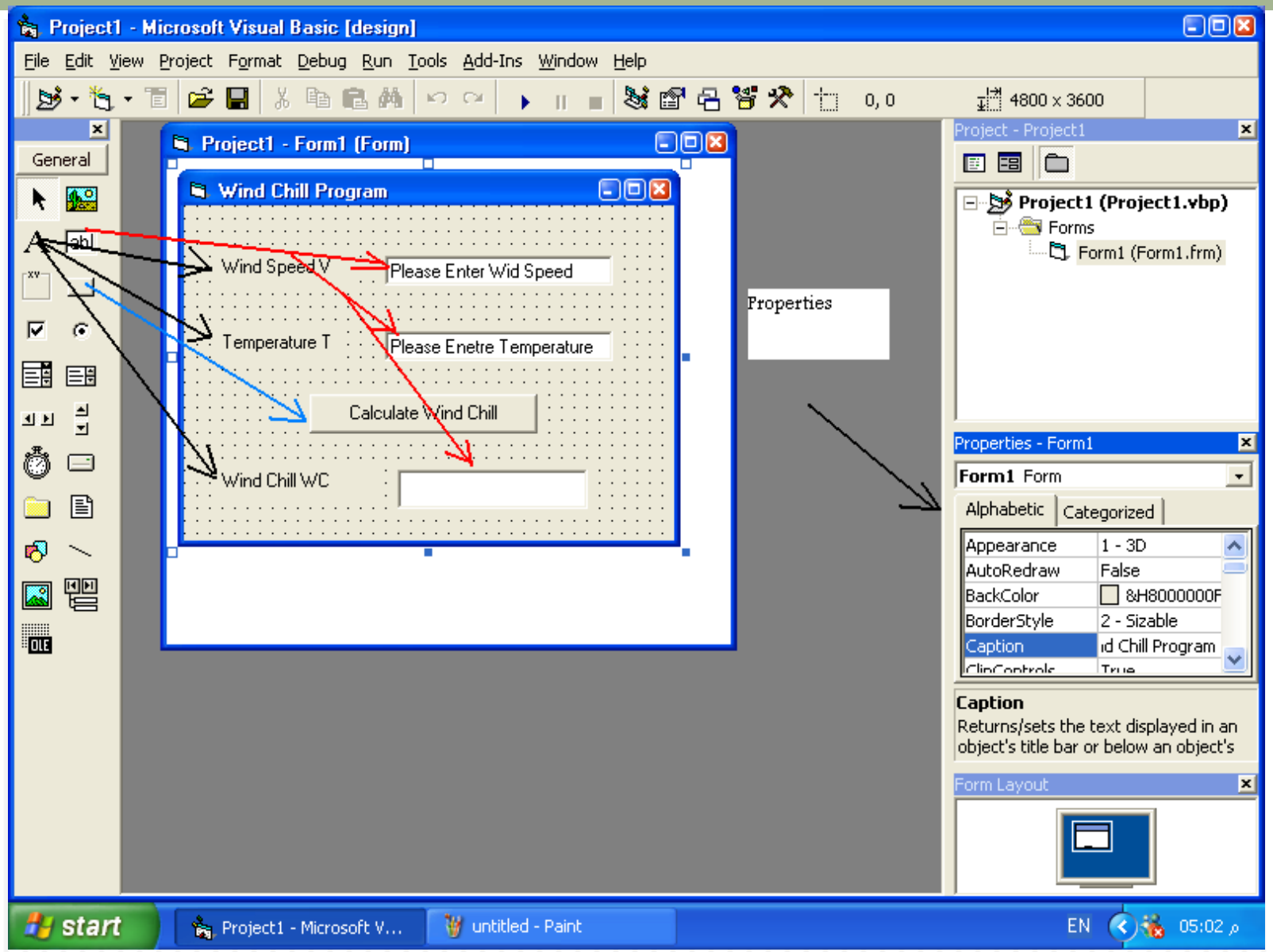
  WC = 0.0817(3.71(V **0.5) + 5.81 - 0.25V)(T - 91.4) + 91.4

- Visual Basic statement

  WC = 0.0817 * (3.71 * Sqr(V) + 5.81 -(0.25 * V)) * (T - 91.4) + 91.4

- Output: Wind Chill (WC)
- Input 1 T: Temperature
- Input 2 V: Wind Speed

Adding Controls and Changing their Properties



Writing the Code

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click
        Dim V As Integer
        Dim T As Integer
        Dim WC As Double
        v = Val(TextBox1.Text)
        T = Val(TextBox2.Text)
        WC = 0.0817 * (3.71 * Math.Sqrt(V) + 5.81 - (0.25 * V)) * (T - 91.4) + 91.4
        TextBox3.Text = Str(WC)
    End Sub
```

Running the Application