Answer Key

Chapter 3: Variables, Expressions, and Statements(pgs. 68-105)

Section 1: Variables, Expressions, and Statements

Variables

Data is not entered by you the :programmer. Instead, it comes from:

* Users entering information
* Data gathered as the program runs

To access this information after it has been stored, it must be named.

A good variable name should reflect something about the information it represents.

There are some rules to follow as you create variable names:

* Names may be up to forty characters(letter or numerals) long
* Follow the InterCap method to name variables
  + Use capital letters to show how words or portions of words are put together

Expressions

Expressions are used to calculate values.

* Build expressions from variables and operators
  + Variables represent data
  + Operators represent the actions performed on the data

Five basic math operators:

* Addition : +
* Subtraction : -
* Multiplication : \*
* Division : /
* Exponentiation : ^

Visual Basic expressions follow PEMDAS(parentheses, exponents, multiplication, division, addition, and subtraction.

Statements

The statements of a program are the instructions you write that the computer executes.

One of the most common types of statements you will write is an assignment statement

* An assignment statement evaluates an expression and assigns the value to a variable
* Use the equal sign to show assignment
  + This statement can be a single value or a combination of values and variables

**Refer to the book to see how to translate algebraic expressions**

Trying Out Expressions and Statements

Variables and Debugging

As opposed to algebraic variables, Visual Basic variables can change values as a program runs.

A program is a process that unfolds in time, a sequence of instructions for the computer to carry out, which programmers specify in its entirety before the program is run.

A bug is a deviation between the way a program is supposed to behave and the way it actually does.

* The process of eliminating deviations is called debugging
  + The most common way to debug a program is to look at the values the program assigns to variables as it runs
  + You can stop a program while it is running by setting break points - these mark spots where you want the program to stop executing

**Refer to the book to learn how to use break points and how to program a digital clock**

Data Types

Looking at the Different Types

The eight different data types include:

* Integer
  + Whole numbers
  + Range : -32,768 to +32,767
* Long
  + Whole numbers
  + Range : -2,147,483,648 to +2,147,483,647
  + Visual Basic does not recognize numbers with commas in expressions
* Single
  + Decimal numbers and whole numbers
  + Range : -3.402823E38 to -1.401298E-45 for negative numbers and 1.401298E-45 to 3.402823E38 for positive numbers
* Currency
  + Dollar amounts
    - Singles can also be used, but in the conversion from decimal to binary and back, round-off error can occur
* String
  + Characters including:
    - Text
    - Special characters such as the pound sign(#), the underscore (\_), and the tilde(~)
    - Digits, 0-9
  + A set of characters contained in double quotes is called a string literal or string
  + Two types of variables to hold strings:
    - Fixed-length string variables hold only the number of characters you specify
    - Variable-length string variables can hold strings up to about 65,000 characters long
* Variant
  + Numbers, strings, times, or dates
  + Takes up a lot of memory space
* User Defined
  + These are detailed in Chapter 12

Guided Notes

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Variables

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* Users \_\_\_\_\_\_\_\_\_\_\_ information
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To access this information after it has been stored, it must be \_\_\_\_\_\_\_\_.

A good variable name should reflect something about the information it represents.

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Expressions

Expressions are used to calculate \_\_\_\_\_\_\_\_\_\_.

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  + \_\_\_\_\_\_\_\_\_ represent data
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Five basic math operators:

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Visual Basic expressions follow \_\_\_\_\_\_\_\_ (parentheses, exponents, multiplication, division, addition, and subtraction.

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A \_\_\_\_\_\_\_ is a deviation between the way a program is supposed to behave and the way it actually does.

* The process of eliminating deviations is called \_\_\_\_\_\_\_\_\_\_\_\_\_
  + The most common way to debug a program is to look at the values the program assigns to variables as it runs
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