

Introduction to Programming

Using Visual Basic.NET



Prepared by

Prof.Dr. Eng. Ahmed Fahmy Amin Mahrous

Professor of Computers, Arab Academy for Science and Technology
Minister's Consultant for Information Technology

Revised by

Prof. Salah Amin Elewa
Director, Technology Development
Ministry of Education

Translated by

Eng. Emad El-Din Elsayed Ahmed
American University in Cairo

Acknowledgments

Most importantly, we are grateful to Prof. Dr. Yousry Saber Elgamal, the Minister of Education, for giving us the opportunity to write this book, for his support and understanding.

Many people have worked very hard to design and produce this text. However, there are a number of people who deserve special recognition. First we would like to thank Mrs. **Suzan Abdel Fatah Marzouk**, the General Director of computer Education, and **Mrs. Salma Aly Ibrahim**, the Computer expert at the Preparatory Department for their extremely helpful suggestions on content and pedagogy as well as revision of the Arabic version.

We are fortunate to have worked on this book with the talented and dedicated team of the Graphics Department at the Ministry of Education. We appreciate the extra ordinary efforts of Dr. **Fathia khairy** and **Eng. Manal Elgendy** for their remarkable job that turned the rough wording into a fine book. We would like also to thank **Miss Enjy Abd Allah** for her great effort to upload the book at the Ministry web site, and we can't forget to thank **the Technical office stuff** (TDC) for their excellent technical editing of the text.

Preface

This book is designed primarily to teach programming fundamentals. The important point here is that many Visual Basic texts focus on the “Cool Visual Basic gizmos” and, in doing so, fail to teach the programming concepts that are common to all languages. That is why we titled our book “Introduction to programming using Visual Basic Dot NET”, not “Learning Microsoft Visual Basic Dot NET”. We think this distinction is important because languages come and go, but fundamental concepts underlying the programming process stay fairly constant.

If teaching programming fundamentals is our primary goal, then why we have chosen Visual Basic Dot NET and not some other language? The answer is simple: we feel that Visual Basic Dot NET is the language that facilitates our main goal by being relatively easy to learn without the overly complex syntactic and semantic rules found in some other languages.

In fact, our book is consisting of two parts, one part for each term. If you look at table of contents of this second part, you will find that it consists of 4 Chapters:

- **Chapter 1 explains how to:**

differentiate between numeric and string data, declare variables and constants, convert text input to numeric values and vice versa, and how to use Try/Catch blocks for error handling.

- **Chapter 2 explains how to:**

use IF statement to control the flow of a program, use IF...Then...Else statements general form, evaluate conditions using the comparison operators, combine conditions using "And", and "Or", compare strings, and how to use radio buttons and check boxes.

- **Chapter 3 explains how to:**

use the Do While...Loop, Do Until...Loop , Do...Loop While, Do...Loop Until, and For...Next repetition structures. In addition to that you will learn how to use ListBox controls.

- **Chapter 4 explains how to:**

use Timer object and its Tick event, use Timer object to design digital clock, and how to use Timer object in animation.

The course website, available at www.moe.gov.eg contains a number of files that give you the opportunity to see visually the steps taken to solve any given example.

As you read the book or watch the videos of the exercises, we would sincerely appreciate your comments, and suggestions for improvement. Please address all correspondences to:

vb@emoe.org

Table of Contents

CHAPTER ONE	Representing Data	1
	1.1 Introduction	1
	1.2 Data Variables and Constants	2
	1.2.1 Data Types	4
	1.2.2 Naming Rules	7
	1.2.3 Choosing the appropriate data type for a variable	8
	1.3 Constants	10
	1.3.1 Intrinsic constants	10
	1.3.2 Named constants	10
	1.4 Variables	12
	1.4.1 Declaring a Variable Using Dim Statement	12
	1.4.2 Declaring Multiple Variables Using One Dim Statement	13
	1.5 The assignment Statements	14
	1.5.1 The Assignment Statements for Strings	18
	1.6 Conversion Between different data types	19
	1.6.1 Conversion of Strings to Numeric Data Types	19
	1.6.2 Conversion of Numeric Data types to Strings	22
	1.7 Arithmetic Operations	23
	1.7.1 The Integer division and the Modulus(Remainder of division)	24
	1.7.2 The Exponentiation	24
	1.8 Try/Catch Block	30

	1.9 Converting between Numeric data types	34
	1.9.1 Implicit (automatic) conversions	34
	1.9.2 Explicit conversions	36
	1.10 Precedence of operations	37
	1.11 Scope of Variables	39
	1.12 Questions	40
CHAPTER TWO	Conditions and Decisions	44
	2.1 Introduction	44
	2.2 Using Conditional Expressions	44
	2.3 IF... Then... Else Statement	45
	2.3.1 Simple IF... Then Statement	49
	2.3.2 IF... Then... Else Statement General Form	50
	2.4 Compound Conditions	51
	2.5 Comparing Strings	59
	2.6 Using IF Statements with Radio Buttons, Check Boxes, and Group Box Controls	62
	2.6.1 RadioButton Controls	63
	2.6.2 The CheckBox Controls	65
	2.6.3 The GroupBox control	67
	2.7 Questions	86
CHAPTER THREE	Repetition Statements	91
	3.1 Introduction	91
	3.2 The Do While... Loop Structure	92
	3.3 The Do Until... Loop Structure	99
	3.4 The Do... Loop While Structure	101

3.5 The Do...Loop Until Structure	109
3.6 The For...Next Loop Structure	110
3.6.1. Examples Using the For...Net Statement	112
3.7 ListBox control	113
3.8 Questions	122
CHAPTER FOUR Timers	127
4.1 Introduction	127
4.2 Using Timer	127
4.2.1 The DateTime Structure	128
4.3 The Use of Timers in Animation	140
4.3.1 Moving a picture	141
4.4 Questions	148