

# Contents

## Introduction

Introduction to Programming .....	1
Introduction .....	2
What is a Program?.....	2
Role Played by a Program to Perform a Task .....	2
What is a Programming Language?.....	3
Types of Programming Languages .....	3
High Level Language .....	4
Assembly Language.....	4
Low Level Language.....	4
High Level to Low Level Language Conversion .....	5
Using Interpreters .....	5
Using Compilers.....	5
Program Development Life Cycle.....	6
Analyzing the Problem.....	8
Developing a Solution .....	9
Coding the Solution .....	11
Testing and Debugging the Program.....	12
Object Oriented Programming (OOP).....	12
Encapsulation .....	13
Abstraction .....	13
Inheritance.....	13
Polymorphism .....	13
Event-driven Programming.....	14
What is .NET?.....	14
Common Language Runtime (CLR).....	14
Base Class Library .....	16
Assemblies .....	16
Garbage Collection .....	16
Introducing Visual Studio 2005.....	17
System Requirements.....	17
Installing Visual Studio 2005.....	18
Installing IIS 6.0.....	18
Installing Visual Studio 2005.....	19
Opening Visual Studio 2005.....	22

Visual Studio 2005 Integrated Development Environment.....	24
Title Bar .....	25
Menu Bar .....	25
Toolbar.....	25
Toolbox.....	26
Solution Explorer Window .....	26
Properties Window .....	26
Design Window.....	26
Code Window .....	27
Project Designer .....	28
IntelliSense—Writing Correct Code .....	28
Symbolic Renaming.....	29
Conclusion .....	30

## Visual Basic 2005

1. Getting Started with Visual Basic 2005 .....	33
Keywords.....	34
Arithmetic Operators.....	36
Different Data Types.....	39
Statements .....	41
All about Statement Syntax.....	41
The Option and Imports Statements.....	44
Declaring Variables.....	45
Declaring Constants .....	47
Data Type Conversion.....	48
Control Statements.....	50
If... Then... Else Statement.....	50
Select... Case Statement .....	51
Loops.....	51
For... Next Loop.....	51
Do Loop.....	52
While... End While Loop.....	53
Creating Arrays.....	53
Creating Enumerations.....	53
Creating Structures.....	54
String Concatenation.....	55
Val and Str Functions .....	55
Creating Visual Basic 2005 Applications.....	56

Creating a Console Application.....	57
Creating a Windows Application .....	59
Creating a Web Application.....	62
Saving a Visual Basic 2005 Application.....	67
Closing the Application and Quitting Visual Studio 2005 .....	67
Conclusion .....	68
<b>2. Object Oriented Programming .....</b>	<b>69</b>
Basic Principles of Object Oriented Programming (OOP).....	70
Encapsulation .....	70
Abstraction .....	70
Inheritance.....	71
Polymorphism .....	71
Member Access Modifiers.....	71
Defining a Class.....	72
Adding Variables to a Class.....	73
Adding Methods to a Class .....	73
Creating Objects.....	74
Constructors .....	75
Inheritance .....	76
Defining a Subclass.....	77
Abstract Classes .....	77
Characteristics of an Abstract Class .....	77
Declaring an Abstract Class.....	77
Characteristics of an Abstract Method.....	78
Declaring an Abstract Method .....	78
Inheriting an Abstract Class .....	79
An Abstract Class Example.....	79
Interfaces—Multiple Inheritance.....	83
Characteristics of an Interface .....	84
Declaring an Interface.....	84
Declaring Methods of an Interface .....	84
An Interface Example.....	84
Polymorphism .....	88
Implementing Polymorphism by Method Overloading .....	88
Implementing Polymorphism by Method Overriding .....	92
Conclusion .....	94
<b>3. Windows Forms .....</b>	<b>95</b>
Introduction to Windows Form.....	96
A Windows Form in Code.....	104

Setting the Title Bar Text .....	106
Minimizing or Maximizing a Form.....	106
Adding/Removing Min/Max Buttons and Setting the Form Border.....	107
Setting the Initial Position of a Form .....	107
Working with Multiple Forms.....	108
Setting the Startup Form .....	111
Creating Owned Forms .....	114
Creating Always-on-Top Form .....	115
Adding Controls to a Form.....	115
Setting Controls' Tab Order.....	117
Naming Controls.....	117
Setting Properties at Design Time .....	118
Docking and Anchoring Controls.....	121
Setting Properties at Run Time.....	123
Showing and Hiding Controls and Forms .....	124
Moving and Sizing Forms and Controls in Code .....	125
Adding and Removing Controls at Run Time .....	126
Setting the Mouse Pointer in Controls.....	127
Creating a Message Box .....	129
Using the MsgBox Function .....	130
Using the MessageBox.Show Function.....	133
Creating an Input Box .....	136
Multiple Document Interface (MDI) Form .....	139
Creating MDI Applications .....	139
Creating MDI Child Windows in Code.....	141
Arranging MDI Child Windows .....	144
Creating a Dialog Box .....	145
Displaying Reading Data from Dialog Boxes .....	147
Creating Accept and Cancel Buttons.....	148
Commenting the Code.....	149
Handling Events.....	150
Beeping .....	151
Conclusion .....	151
4. Label, TextBox, Button, ComboBox, and ListBox Controls .....	153
Introduction .....	154
Label Control .....	154
TextBox Control .....	156

Button Control.....	160
ComboBox Control.....	162
ListBox Control.....	166
Project .....	169
Conclusion .....	176
5. CheckBox, RadioButton, and GroupBox Controls.....	177
CheckBox Control.....	178
RadioButton Control.....	180
GroupBox Control .....	183
Project .....	186
Conclusion .....	196
6. Panel, PictureBox, ProgressBar and Timer Controls.....	197
Panel Control .....	198
PictureBox Control.....	200
ProgressBar Control.....	204
Timer Control.....	205
Project .....	207
Understanding the Project .....	207
Understanding the Code.....	209
Conclusion .....	212
7. Menus, Built-in Dialog Boxes, Printing, and TreeView Controls....	213
Introduction .....	214
Menus .....	214
Creating Menus.....	214
Adding Menu Items.....	216
Creating Submenus.....	218
Creating Menu Shortcuts.....	219
Adding Images to Menu Items.....	221
Creating Menu Separators.....	223
FolderBrowserDialog Control.....	224
OpenFileDialog Control.....	227
SaveFileDialog Control.....	231
FontDialog Control.....	235
ColorDialog Control .....	238
PrintDocument Control.....	241
PrintDialog Control .....	241
TreeView Control.....	244

Project .....	250
Conclusion .....	261
<b>8. Mouse Events and Keyboard Events .....</b>	<b>263</b>
Introduction .....	264
Mouse Events .....	264
MouseClicked .....	264
MouseDoubleClick.....	264
MouseDown.....	264
MouseEnter .....	265
MouseHover.....	265
MouseLeave.....	265
MouseMove.....	265
MouseUp.....	265
Keyboard Events.....	267
KeyDown .....	267
KeyPress .....	267
KeyUp.....	268
Project .....	269
Conclusion .....	276
<b>9. Accessing Data using ADO.NET .....</b>	<b>277</b>
What are Databases? .....	278
Connections, Data Adapters, and Datasets.....	279
Basic SQL Statements.....	279
The SELECT Statement .....	280
The WHERE Clause .....	280
The BETWEEN Clause.....	280
The IN Clause .....	281
The LIKE Clause.....	281
The DISTINCT Clause.....	281
The Logical Operations .....	282
The ORDER BY Clause .....	282
The AS Clause .....	282
The Built-in Functions .....	282
The GROUP BY Clause .....	283
The HAVING Clause.....	283
The DELETE Statement .....	283
The UPDATE Statement.....	283
Joining Tables.....	283
Working with ADO.NET .....	284

Overview of ADO.NET Objects .....	284
DataGridView Control.....	286
Accessing Data using Server Explorer.....	289
Creating a New Data Connection.....	290
Accessing Data using Data Adapters and Datasets.....	294
Adding and Configuring a Data Adapter.....	294
Creating a Dataset .....	298
Displaying Data in a DataGridView .....	300
Previewing Data from Data Adapters.....	303
Connecting to an MS Jet Database .....	305
Conclusion .....	314
<b>10. Data Binding .....</b>	<b>315</b>
Introduction .....	316
Simple Data Binding .....	317
Data Binding at Design Time .....	317
Data Binding at Run Time .....	324
Complex Data Binding.....	324
Working with DisplayMember and ValueMember Properties .....	324
Working with DataMember Property .....	327
Implementing Data Binding.....	329
Using TextBox Control .....	329
Using CheckBox Control.....	329
Using ComboBox Control.....	330
Using ListBox Control.....	330
Using DataGridView Control.....	330
Project .....	330
Conclusion .....	338
<b>11. Handling Errors and Exceptions .....</b>	<b>339</b>
Introduction .....	340
Errors .....	340
Syntax Errors .....	340
Run Time Errors .....	344
Logical Errors .....	347
Exceptions .....	349
Standard Exceptions .....	349
User-defined Exceptions .....	355
Project .....	357
Conclusion .....	364

## ASP .NET 2.0

1. ASP.NET 2.0 Essentials .....	367
Introduction to ASP.NET .....	368
Versions of ASP.NET .....	368
Benefits of ASP.NET .....	368
Robust Database-driven Functionality .....	368
Faster Web Applications .....	368
Memory Leak and Crash Protection.....	369
Easy Deployment.....	369
Multiple Development Language Support.....	369
What's New in ASP.NET 2.0?.....	369
Developer Productivity .....	370
Administration and Management.....	372
Performance and Scalability .....	373
Introducing ASP.NET 2.0 IDE .....	373
Visual Web Developer .....	374
Conclusion .....	378
2. Developing a Web Application .....	379
History of Web Applications .....	380
HTML .....	380
DHTML .....	380
Scripting Languages .....	380
Server-side Languages .....	380
PHP .....	381
JSP .....	381
PERL.....	381
Anatomy of ASP.NET 2.0.....	381
ASP.NET 2.0 Provider Model.....	382
ASP.NET 2.0 Coding Models .....	384
Inline Code Model .....	384
The Code-Behind Model.....	386
Code Sharing.....	386
Using the App_Code Folder .....	386
Using the Bin Folder.....	388
Using the Global Assembly Cache.....	388
Compilation in ASP.NET 2.0 .....	389
Managing States of an ASP.NET Application .....	389
The Application-State.....	391



The Session-State .....	391
The View-State .....	391
Using Application-State, Session-State, and View-state .....	392
Conclusion .....	395
<b>3. Standard Controls .....</b>	<b>397</b>
Introducing Controls .....	398
Designer Support for Controls .....	398
Introduction to Standard Controls .....	398
WebControl Class .....	402
Label Control .....	402
Changing Properties of a Label Control .....	403
TextBox Control .....	404
Setting Properties of a TextBox Control .....	405
Button Control .....	408
Setting Properties of a Button Control .....	409
Handling Events of a Button Control .....	415
ImageButton Control .....	416
Setting Properties of a ImageButton Control .....	417
ListBox Control .....	421
Setting Properties of a ListBox Control .....	424
RadioButton Control .....	427
Setting Properties of a RadioButton Control .....	428
Handling Events of a RadioButton Control .....	430
Conclusion .....	431
<b>4. Navigation Controls .....</b>	<b>433</b>
Introduction to Navigation Controls .....	434
SiteMapPath Control .....	434
Using SiteMapPath Control .....	435
Customizing the Appearance of SiteMapPath Control .....	444
Menu Control .....	447
Menu Class .....	447
Using Menu Control .....	448
TreeView Control .....	453
Using TreeView Control .....	455
Conclusion .....	464
<b>5. Validation Controls .....</b>	<b>465</b>
Introduction to Validation Controls .....	466
BaseValidator Class .....	466

RequiredFieldValidator Control .....	467
RequiredFieldValidator Class .....	467
Using RequiredFieldValidator Control .....	468
RangeValidator Control.....	471
RangeValidator Class .....	472
Using RangeValidator Control.....	472
RegularExpressionValidator Control.....	475
RegularExpressionValidator Class .....	475
Using RegularExpressionValidator Control.....	476
CompareValidator Control.....	478
CompareValidator Class .....	479
Using CompareValidator Control.....	479
CustomValidator Control.....	482
CustomValidator Class .....	482
Using CustomValidator Control.....	482
ValidationSummary Control .....	485
ValidationSummary Class .....	486
Using ValidationSummary Control.....	486
Conclusion .....	488
<b>6. Login Controls .....</b>	<b>489</b>
Introduction to Login Controls .....	490
Creating User Account in ASP.NET.....	490
Login Control.....	494
Using Login Control.....	494
Customizing a Login Control .....	497
LoginView Control.....	498
LoginName Control .....	499
Using LoginName Control .....	500
LoginStatus Control .....	501
Using LoginStatus Control .....	502
PasswordRecovery Control .....	504
Configuring Web.Config File for Password Recovery.....	509
Conclusion .....	510
<b>7. WebParts Controls .....</b>	<b>511</b>
Introduction to WebParts Controls .....	512
WebPartManager Class.....	512
Using WebPartManager Control .....	512
ProxyWebPartManager Class.....	513

Using ProxyWebPartManager Control.....	514
WebPartZone Class .....	515
Using WebPartZone Control.....	515
CatalogZone Class.....	516
Using CatalogZone Control.....	516
EditorZone Class.....	517
Using EditorZone Control.....	517
ConnectionsZone Class .....	518
Using ConnectionsZone Control.....	518
Creating a Web Application using WebParts Controls.....	519
Conclusion .....	526
<b>8. Working with Databases .....</b>	<b>527</b>
What are Databases? .....	528
Working with ADO.NET .....	528
Disconnected Data Architecture .....	528
Accessing Data using ADO.NET .....	529
Overview of ADO.NET Objects .....	530
Data Adapters and Datasets .....	531
Basic SQL Statements.....	532
The Select Statement .....	532
The Where Clause .....	533
The GroupBy Clause .....	533
The Built-in Functions .....	534
ASP.NET 2.0 Data Display Controls .....	534
GridView Control.....	535
DataList Control.....	541
DetailsView Control .....	544
Repeater Control .....	549
ASP.NET 2.0 Data Source Controls.....	551
SqlDataSource Control.....	551
AccessDataSource Control .....	552
ObjectDataSource Control .....	553
XmlDataSource Control .....	554
Accessing Data with Server Explorer .....	555
Creating a Web Application using Data Display Controls .....	557
Conclusion .....	565
<b>9. Master Pages and Themes .....</b>	<b>567</b>
Need for Master Pages and Themes .....	568

Creating Simple Master Pages.....	568
Creating Nested Master Pages.....	573
Themes.....	575
Page Theme.....	575
Global Theme.....	575
Creating Themes .....	575
Applying Themes on Controls at Run Time .....	579
Conclusion .....	582
10. Caching in ASP.NET 2.0 .....	583
Introduction .....	584
Caching Techniques .....	585
Output Caching .....	585
Partial-Page Output Caching.....	590
Data Caching.....	591
Understanding Cache Dependencies.....	597
Conclusion .....	598
11. Application Globalization.....	599
Globalization .....	600
Internationalization.....	602
Localization .....	602
Culture.....	603
Resources.....	605
Global Resources .....	605
Local Resources.....	606
Localization Expression.....	606
Implicit Localization Expression .....	607
Explicit Localization Expression.....	614
Implementing Localization .....	620
Elements of HTML.....	620
Static Content .....	620
Conclusion .....	622

## C# 2005

1. Introduction to Visual C# 2005 .....	625
Introduction .....	626
Features of Visual C# 2005.....	627
Creating Visual C# 2005 Applications.....	627

Creating a Console Application.....	627
Creating a Windows Application .....	630
Creating a Web Application.....	633
Keywords.....	636
Identifiers .....	636
Data Types .....	637
Value Types.....	637
Reference Types.....	641
Pointer Types .....	642
Variables.....	642
Declaration of Variables.....	643
Initialization of Variables .....	644
Scope of Variables.....	645
Local Variables.....	645
Static Variables .....	645
Instance Variables .....	646
Constants .....	646
Type Conversion .....	647
Implicit Conversion .....	647
Explicit Conversion .....	647
Operators .....	648
Arithmetic Operators.....	648
Relational Operators.....	653
Logical Operators .....	655
Conditional Operators.....	656
Assignment Operators.....	657
Increment and Decrement Operators.....	657
Operator Precedence and Associativity.....	658
Punctuators .....	659
Expressions .....	660
Arithmetic Expressions.....	660
Evaluation of Expressions.....	660
Control Statements.....	660
if Statement .....	661
switch Statement.....	667
Conditional Operator .....	670
Loops.....	670
while Loop.....	670
do Loop.....	672
for Loop .....	673

foreach Loop.....	675
Interrupting Loops using Jump Statements.....	676
The break Statement.....	676
The continue Statement.....	677
The goto Statement .....	678
Creating Arrays.....	679
Assigning Values to Array Elements .....	680
Accessing Values Stored in Array Elements .....	680
Creating Enumerations.....	681
Creating Structures .....	683
Storing Data within a Structure .....	683
Creating Collections .....	685
Methods .....	687
Declaring Methods .....	687
The Main Method.....	687
Invoking Methods .....	688
Passing Parameters to Methods .....	691
Method Overloading .....	693
Conclusion .....	694
<b>2. Object Oriented Programming .....</b>	<b>695</b>
Basic Principles of Object Oriented Programming (OOP).....	696
Encapsulation .....	696
Abstraction .....	696
Inheritance.....	697
Polymorphism .....	697
Member Access Modifiers.....	697
Defining a Class.....	698
Adding Variables to a Class.....	699
Adding Methods to a Class .....	699
Creating Objects.....	699
Constructors .....	701
Static Members.....	702
Inheritance .....	704
Defining a Subclass.....	704
Abstract Classes .....	705
Characteristics of an Abstract Class .....	705
Declaring an Abstract Class.....	705
Characteristics of an Abstract Method.....	706
Declaring an Abstract Method .....	706

Inheriting an Abstract Class .....	706
An Abstract Class Example.....	707
Interfaces— Multiple Inheritance.....	712
Characteristics of an Interface .....	712
Declaring an Interface.....	712
Declaring Methods of an Interface .....	713
An Interface Example.....	713
Polymorphism .....	716
Implementing Polymorphism by Method Overloading .....	716
Implementing Polymorphism by Method Overriding .....	721
Operator Overloading .....	723
Conclusion .....	726
<b>3. Windows Forms .....</b>	<b>727</b>
Introduction to Windows Form.....	728
A Windows Form in Code.....	736
Setting the Title Bar Text .....	738
Minimizing or Maximizing a Form.....	738
Working with Multiple Forms.....	739
Setting the Startup Form .....	742
Adding Controls to a Form.....	743
Setting Controls' Tab Order.....	744
Setting Properties at Design Time .....	745
Docking and Anchoring Controls.....	748
Setting Properties at Run Time.....	750
Showing and Hiding Controls and Forms .....	751
Creating a Message Box .....	752
Commenting the Code.....	755
Handling Events.....	755
Conclusion .....	756
<b>4. Label, TextBox, Button, ComboBox, and ListBox Controls .....</b>	<b>757</b>
Introduction .....	758
Label Control .....	758
TextBox Control .....	760
Button Control.....	763
ComboBox Control.....	765
ListBox Control.....	769
Project .....	773

Conclusion .....	780
5. CheckBox, RadioButton, and GroupBox Controls.....	781
CheckBox Control.....	782
RadioButton Control.....	784
GroupBox Control .....	788
Project .....	791
Conclusion .....	802
6. Panel, PictureBox, ProgressBar and Timer Controls.....	803
Panel Control .....	804
PictureBox Control.....	806
ProgressBar Control.....	809
Timer Control.....	810
Project .....	812
Understanding the Project .....	813
Understanding the Code.....	815
Conclusion .....	818
7. Menus, Built-in Dialog Boxes, Printing, and TreeView Controls....	819
Introduction .....	820
Menus .....	820
Creating Menus.....	820
Adding Menu Items.....	822
Creating Submenus.....	824
Creating Menu Shortcuts.....	825
Adding Images to Menu Items .....	827
Creating Menu Separators.....	828
FolderBrowserDialog Control.....	830
OpenFileDialog Control.....	833
SaveFileDialog Control.....	837
FontDialog Control.....	840
ColorDialog Control .....	844
PrintDocument Control.....	846
PrintDialog Control .....	847
TreeView Control.....	850
Project .....	856
Conclusion .....	867



8. Mouse Events and Keyboard Events .....	869
Introduction .....	870
Mouse Events .....	870
MouseClicked .....	870
MouseDown .....	870
MouseDoubleClick .....	870
MouseEnter .....	871
MouseHover .....	871
MouseLeave .....	871
MouseMove .....	871
MouseUp .....	871
Keyboard Events .....	873
KeyDown .....	873
KeyPress .....	874
KeyUp .....	874
Project .....	875
Conclusion .....	882
9. Accessing Data using ADO.NET .....	883
What are Databases? .....	884
Connections, Data Adapters, and Datasets .....	885
Basic SQL Statements .....	885
The SELECT Statement .....	886
The WHERE Clause .....	886
The BETWEEN Clause .....	886
The IN Clause .....	887
The LIKE Clause .....	887
The DISTINCT Clause .....	887
The Logical Operations .....	887
The ORDER BY Clause .....	888
The AS Clause .....	888
The Built-in Functions .....	888
The GROUP BY Clause .....	889
The HAVING Clause .....	889
The DELETE Statement .....	889
The UPDATE Statement .....	889
Joining Tables .....	889
Working with ADO.NET .....	890
Overview of ADO.NET Objects .....	890
DataGridView Control .....	892

Accessing Data using Server Explorer.....	895
Creating a New Data Connection.....	895
Accessing Data using Data Adapters and Datasets.....	899
Adding and Configuring a Data Adapter.....	899
Creating a Dataset .....	904
Displaying Data in a DataGridView .....	906
Previewing Data from Data Adapters.....	909
Connecting to an MS Jet Database .....	911
Conclusion .....	920
10. Data Binding .....	921
Introduction .....	922
Simple Data Binding .....	923
Data Binding at Design Time .....	923
Data Binding at Run Time .....	930
Complex Data Binding.....	931
Working with DisplayMember and ValueMember Properties .....	931
Working with DataMember Property .....	934
Implementing Data Binding.....	936
Using TextBox Control .....	936
Using CheckBox Control.....	936
Using ComboBox Control.....	937
Using ListBox Control.....	937
Using DataGridView Control.....	937
Project .....	937
Conclusion .....	945
11. Handling Errors and Exceptions .....	947
Introduction .....	948
Errors .....	948
Syntax Errors .....	948
Run Time Errors .....	951
Logical Errors .....	954
Exceptions .....	957
Standard Exceptions .....	957
User-defined Exceptions .....	964
Project .....	966
Conclusion .....	972
About the CD .....	973