

CONTENTS IN DETAIL

INTRODUCTION

On Programming	2
Why Language Matters	3
What Is JavaScript?	6
Trying Programs	7
Overview of This Book	7
Typographic Conventions	8

1

BASIC JAVASCRIPT: VALUES, VARIABLES, AND CONTROL FLOW

	9
Values	9
Numbers	10
Arithmetic	11
Strings	12
Unary Operators	13
Boolean Values, Comparisons, and Boolean Logic	13
Expressions and Statements	14
Variables	15
Keywords and Reserved Words	16
The Environment	17
Functions	17
prompt and confirm	18
The print Function	18
Modifying the Environment	18
Program Structure	19
Conditional Execution	19
while and do Loops	20
Indenting Code	22
for Loops	22
Breaking Out of a Loop	23
Updating Variables Succinctly	23
Dispatching on a Value with switch	24
Capitalization	24
Comments	25

More on Types	25
Undefined Values	25
Automatic Type Conversion	26
Dangers of Automatic Type Conversion	27
More on && and 	28

2 FUNCTIONS 29

The Anatomy of a Function Definition	29
Definition Order	30
Local Variables	31
Nested Scope	31
The Stack	33
Function Values	33
Closure	34
Optional Arguments	35
Techniques	36
Avoiding Repetition	36
Purity	37
Recursion	37

3 DATA STRUCTURES: OBJECTS AND ARRAYS 41

The Problem: Aunt Emily's Cats	41
Basic Data Structures	43
Properties	43
Object Values	43
Objects as Sets	45
Mutability	45
Objects as Collections: Arrays	46
Methods	48
Solving the Problem of Aunt Emily's Cats	48
Separating Paragraphs	49
Finding Relevant Paragraphs	49
Extracting Cat Names	51
The Full Algorithm	51
Cleaning Up the Code	52
Date Representation	54
Date Extraction	56
Gathering More Information	57
Data Presentation	58
Some More Theory	59
The arguments Object	59
Tying Up a Loose End	61

The Math Object.....	61
Enumerable Properties.....	62

4 ERROR HANDLING 63

Types of Problems	63
Programmer Mistakes	64
Run-Time Errors	64
Handling Errors	64
Returning a Special Value	65
Exceptions	66
Cleaning Up After Exceptions	67
Error Objects	68
Unhandled Exceptions.....	68
Selective Catching	69
Automated Testing	70

5 FUNCTIONAL PROGRAMMING 71

Abstraction	71
Higher-Order Functions	73
Modifying Functions.....	74
The reduce Function	75
Mapping Arrays	76
The Sad Story of the Recluse.....	77
HTML	77
The Recluse's Text File	79
Finding Paragraphs	82
Emphasis and Footnotes	82
Moving the Footnotes	85
Generating HTML	86
Converting the Recluse's Book.....	89
Other Functional Tricks.....	90
Operator Functions.....	90
Partial Application	91
Composition.....	92

6 OBJECT-ORIENTED PROGRAMMING 93

Objects	94
Defining Methods	94
Constructors	95
Building from Prototype	96

Constructors and Prototypes.....	96
Prototype Pollution	98
Objects as Dictionaries	100
Specifying an Interface	101
Building an Ecosystem Simulation	102
Defining the Terrarium	102
Points in Space	103
Representing the Grid	104
A Bug's Programming Interface.....	106
The Terrarium Object.....	106
this and Its Scope	108
Animating Life	109
It Moves	111
More Life Forms	112
Polymorphism	114
A More Lifelike Simulation.....	115
Inheritance	115
Keeping Track of Energy.....	116
Adding Plant Life.....	118
The Herbivore	119
Bringing It to Life	120
Artificial Stupidity	121
Prototypal Inheritance	122
Type-Definition Utilities	123
Prototypes as Types	124
A World of Objects	125
The instanceof Operator	126
Mixing Types	127

7		129
MODULARITY		
Modules	130	
An Example	130	
Modules as Files	130	
The Shape of a Module	131	
Functions as Local Namespaces	132	
Module Objects	133	
Interface Design	134	
Predictability	134	
Composability	135	
Layered Interfaces	135	
Argument Objects	136	
Libraries	137	

8 **REGULAR EXPRESSIONS** **139**

Syntax	139
Matching Sets of Characters	140
Matching Word and String Boundaries	141
Repeating Patterns	142
Grouping Subexpressions.....	142
Choosing Between Alternatives	143
Matching and Replacing	143
The match Method	143
Regular Expressions and the replace Method	144
Dynamically Creating RegExp Objects	146
Parsing an .ini File.....	147
Conclusion	149

9 **WEB PROGRAMMING: A CRASH COURSE** **151**

The Internet	151
URLs	152
Server-Side Programming	152
Client-Side Programming	153
Basic Web Scripting	153
The window Object	153
The document Object.....	154
Timers	155
Forms	156
Scripting a Form	158
Autofocus	160
Browser Incompatibility	160
Further Reading	162

10 **THE DOCUMENT OBJECT MODEL** **163**

DOM Elements	163
Node Links	164
Types of Nodes.....	165
The innerHTML Property	165
Finding Your Node	166
Node Creation	166
A Creation Helper Function	167
Moving Nodes Around	168
An Implementation of print.....	169

Style Sheets	169
The style Property	170
Hiding Nodes	171
Positioning	171
Controlling Node Size	172
Word of Caution	172

11 BROWSER EVENTS 173

Event Handlers	173
Registering a Handler	174
Event Objects	175
Mouse-Related Event Types	176
Keyboard Events	177
Stopping an Event	178
Normalizing Event Objects	178
Tracking Focus	179
Form Events	180
Window Events	180
Example: Implementing Sokoban	181
Level Input Format	181
Program Design	182
Game Board Representation	182
The Controller Object	185

12 HTTP REQUESTS 189

The HTTP Protocol	189
The XMLHttpRequest API	190
Creating a Request Object	191
Simple Requests	191
Making Asynchronous Requests	192
Fetching XML Data	193
Reading JSON Data	194
A Basic Request Wrapper	195
Learning HTTP	195

INDEX 197