

Part 1: Introduction to Python

Real Python Part 1: Introduction to Python

Fletcher Heisler

Contents

1	Introduction	6
	Why this course?	8
	How to use this course	9
	License	10
	Conventions	11
	Errata	13
2	Getting Started	14
	Download Python	14
	Open IDLE	16
	Write a Python script	17
	Screw things up	20
	Store a variable	22
3	Interlude: Leave yourself helpful notes	24
4	Fundamentals: Strings and Methods	26
	Learn to speak in Python	26
	Mess around with your words	29
	Use objects and methods	33
	Assignment: Pick apart your user's input	36

5	Fundamentals: Working with Strings	3 7
	Mix and match different objects	37
	Streamline your print statements	40
	Find a string in a string	42
	Assignment: Turn your user into a l33t h4xor	44
6	Fundamentals: Functions and Loops	45
	Do futuristic arithmetic	45
	Assignment: Perform calculations on user input	48
	Create your own functions	49
	Functions Summary	52
	Assignment: Convert temperatures	54
	Run in circles	55
	Assignment: Track your investments	58
7	Interlude: Debug your code	60
8	Fundamentals: Conditional logic	64
	Compare values	65
	Add some logic	68
	Control the flow of your program	73
	Assignment: Find the factors of a number	77
	Break out of the pattern	78
	Recover from errors	81
	Simulate events and calculate probabilities	84
	Assignment: Simulate an election	87
	Assignment: Simulate a coin toss experiment	88

9	Fundamentals: Lists and Dictionaries	89
	Make and update lists	89
	Assignment: List of lists	95
	Assignment: Wax poetic	96
	Make permanent lists	98
	Store relationships in dictionaries	101
	Assignment: Capital City Loop	107
	Assignment: Reviewing the Fundamentals	108
	Summary	111
10	File Input and Output	112
	Read and write simple files	112
	Use more complicated folder structures	118
	Assignment: Use pattern matching to delete files	124
	Read and write CSV data	125
	Assignment: Create a high scores list from CSV data $\ \ldots \ \ldots \ \ldots \ \ldots \ \ldots$	130
	Assignment: Split a CSV file	131
11	Interlude: Install Packages	133
	Videos	137
12	Interact with PDF files	138
	Read and write PDFs	138
	Manipulate PDF files	143
	Assignment: Add a cover sheet to a PDF file	
	Create PDF files	149
13	SQL database connections	152
	Communicate with databases using SQLite	152
	Use other SOL variants	150

14 Interacting with the web	160
Scrape and parse text from websites	160
Use an HTML parser to scrape websites	168
Interact with HTML forms	172
Interact with websites in real-time	179
15 Scientific computing and graphing	182
Use NumPy for matrix manipulation	182
Use matplolib for plotting graphs	189
16 Graphical User Interface	208
Add GUI elements with EasyGUI	208
Assignment: Use GUI elements to help a user modify files	216
Create GUI application with Tkinter	217
Assignment: Return of the poet	234
17 Web applications	235
Create a simple web application	235
Create an interactive web application	242
Assignment: The poet gains a web presence	248
Put your web application online	249
18 Final Thoughts	251
19 Appendix A: Installing Python	253
Windows	254
Mac OS X	256
Linux	257

20 Appendix B: Regular Expressions	258
Introduction	 258
Basic Syntax	 259
Quick Example	 260
When should you use regular expressions?	 262
Functions	 264
More Practice	 268
Assignment: Data Cleaning with Regular Expressions	 270
Assignment: Reviewing Regular Expressions	 272
1 Appendix C: Primer on Object-Oriented Programming in Python	274
Classes	 276
Instances	 277
Define a class	 278
Instantiating	 280
Instance Methods	 283
Inheritance	 285
Assignment: Comprehension Check	 292
Assignment: Model a farm	 293
Conclusion	 294
2 Acknowledgements	205