



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
	Course Repository	10
	License	11
	Conventions	12
	Errata	14
2	Getting Started	15
	Download Python	15
	Open IDLE	17
	Write a Python script	18
	Screw things up	21
	Store a variable	23
3	Interlude: Leave yourself helpful notes	25
4	Fundamentals: Strings and Methods	27
	Learn to speak in Python	27
	Mess around with your words	30
	Use objects and methods	34
	Assignment: Pick apart your user's input	37

5	Fundamentals: Working with Strings	38
	Mix and match different objects	38
	Streamline your print statements	41
	Find a string in a string	43
	Assignment: Turn your user into a l33t h4xor	45
6	Fundamentals: Functions and Loops	46
	Do futuristic arithmetic	46
	Assignment: Perform calculations on user input	49
	Create your own functions	50
	Functions Summary	53
	Assignment: Convert temperatures	55
	Run in circles	56
	Assignment: Track your investments	59
7	Interlude: Debug your code	61
8	Fundamentals: Conditional logic	65
	Compare values	66
	Add some logic	69
	Control the flow of your program	74
	Assignment: Find the factors of a number	78
	Break out of the pattern	79
	Recover from errors	82
	Simulate events and calculate probabilities	85
	Assignment: Simulate an election	88
	Assignment: Simulate a coin toss experiment	89

9	Fundamentals: Lists and Dictionaries	90
	Make and update lists	90
	Assignment: List of lists	96
	Assignment: Wax poetic	97
	Make permanent lists	99
	Store relationships in dictionaries	102
	Assignment: Capital City Loop	108
	Assignment: Cats with Hats	109
	Assignment: Reviewing the Fundamentals	110
	Summary	113
10	File Input and Output	114
	Read and write simple files	114
	Use more complicated folder structures	120
	Assignment: Use pattern matching to delete files	126
	Read and write CSV data	127
	Assignment: Create a high scores list from CSV data	132
	Assignment: Split a CSV file	133
11	Interlude: Install Packages	135
	Videos	139
12	Interact with PDF files	140
	Read and write PDFs	140
	Manipulate PDF files	145
	Assignment: Add a cover sheet to a PDF file	150
	Create PDF files	151
13	SQL database connections	154
	Communicate with databases using SQLite	154
	Use other SQL variants	161

14 Interacting with the web	162
Scrape and parse text from websites	162
Use an HTML parser to scrape websites	170
Interact with HTML forms	174
Interact with websites in real-time	181
15 Scientific computing and graphing	184
Use NumPy for matrix manipulation	184
Use matplotlib for plotting graphs	191
16 Graphical User Interface	210
Add GUI elements with EasyGUI	210
Assignment: Use GUI elements to help a user modify files	218
Create GUI application with Tkinter	219
Assignment: Return of the poet	236
17 Web applications	237
Create a simple web application	237
Create an interactive web application	244
Assignment: The poet gains a web presence	250
Put your web application online	251
18 Final Thoughts	253
19 Appendix A: Installing Python	255
Windows	256
Mac OS X	258
Linux	259

20 Appendix B: Regular Expressions	260
Introduction	260
Basic Syntax	261
Quick Example	262
When should you use regular expressions?	264
Functions	266
More Practice	270
Assignment: Data Cleaning with Regular Expressions	272
Assignment: Reviewing Regular Expressions	274
21 Appendix C: Primer on Object-Oriented Programming in Python	276
Classes	278
Instances	279
Define a class	280
Instantiating	282
Instance Methods	285
Inheritance	287
Assignment: Comprehension Check	294
Assignment: Model a farm	295
Conclusion	296
22 Acknowledgements	297