Table of Contents

Prefac		Writing a Simple Scr i . Spidesing with Pole Creating Items	x
Part I		Outputting Items The Item Pipeline	- 1
1. Y	our First Web Scraper	Logging with Scrapy More Resources	3
	Connecting		3
			6
	Installing BeautifulSoup		6
	Running BeautifulSoup	Storing Data to CSV	8
	Connecting Reliably and Handling Exceptions	MySQL	0
2. A	Advanced HTML Parsing	Installing MySQL	5
	You Don't Always Need a Hammer		5
A	Another Serving of BeautifulSoup	1 Database Technique	5
	find() and find_all() with BeautifulSoup	Six Degrees" in N	3
	Other BeautifulSoup Objects	Email 20)
	Navigating Trees	21	1
	Regular Expressions	25	5
	Regular Expressions and BeautifulSoup Accessing Attributes	29	
L	ambda Expressions		
3. W	Vriting Web Crawlers	Document Encoding	
Ti	raversing a Single Domain	ne za Encoding an	,
C	Crawling an Entire Site	V2O 37	7
		40 Reading CSV File)
C	Crawling Across the Internet	42	
4 144	tol C " xoob. I		
4. W	/eb Crawling Models	49	
PI	lanning and Defining Objects		
D	Dealing with Different Website Layouts	53 Cleaning in Code	

	Structuring Crawlers		58
	Crawling Sites Through Search		58
	Crawling Sites Through Links		61
	Crawling Multiple Page Types		64
	Thinking About Web Crawler Models		65
5.	Scrapy		67
	Installing Scrapy		67
	Initializing a New Spider		68
	Writing a Simple Scraper		69
	Spidering with Rules		70
	Creating Items		74
	Outputting Items		76
	The Item Pipeline		77
	Logging with Scrapy		80
	More Resources	Your First Web Scraper	81
	Sissen for the Second Edition	Connecting	
6.	Storing Data		. 83
	Media Files		83
	Storing Data to CSV		86
	MySQL		88
	Installing MySQL		89
	Some Basic Commands		91
	Integrating with Python		94
	Database Techniques and Good Practic	Another Serving of Beautiful Serving 92	97
	"Six Degrees" in MySQL		100
	Email		103
		Navigating Trees	
Par	t II. Advanced Scraping	Regular Expressions Regular Expressions and BeautifulSc	
7.	Reading Documents		107
	Document Encoding		107
	Text		108
	Text Encoding and the Global Internet	Traversing a Single Domain	109
	CSV		113
	Reading CSV Files		113
	PDF		115
	Microsoft Word and .docx		117
			A
8.	Cleaning Your Dirty Data		121
	Cleaning in Code		121

	Duth	124
	Cleaning After the Fact	126
	OpenRefine OpenRefine	126
9.	9. Reading and Writing Natural Languages	133
	Julian	134
	Markov Models	137
	Six Degrees of Wikipedia: Conclusion	141
	Natural Language Toolkit	
	Installation and Setup	
	Statistical Analysis with NLTK	O galossa 145
	Lexicographical Analysis with NLTK	
	Additional Resources Additional Resources	gniverness 151
	The Lagalides and Elisics of Web Scraping.	
10.). Crawling Through Forms and Logins	
		no stold A 153
	Submitting a Basic Form	
	Radio Buttons, Checkboxes, and Other Inputs	
	Submitting Files and Images	
	Handling Logins and Cookies	
	HTTP Basic Access Authentication	
	Other Form Problems	
11	Graning JavaScript	
11.	. Scraping JavaScript	
	A Brief Introduction to JavaScript	164
	Common JavaScript Libraries	
	Ajax and Dynamic HTML	
	Executing JavaScript in Python with Selenium Additional Selenium Webdrivers	
		173 Tython at
	Handling Redirects A Final Note on JavaScript	
12.	. Crawling Through APIs	
-	A Brief Introduction to APIs	
	HTTP Methods and APIs	177
	More About API Responses	
	Parsing JSON	
	Undocumented APIs	
	Finding Undocumented APIs	
	Documenting Undocumented APIs	
	Finding and Documenting APIs Automatically	
	Combining APIs with Other Data Sources	
	o	107

	More About APIs	192
13.	Image Processing and Text Recognition	195
	Overview of Libraries	196
	Pillow Pillow Pillow	196
	Tesseract Data Data	197
	NumPy RisboM yorksM.	199
	Processing Well-Formatted Text moisulance subagistive to sosing Q x 22	199
	Adjusting Images Automatically Ipfloof againgual languard	202
	Scraping Text from Images on Websites	205
	Reading CAPTCHAs and Training Tesseract	208
	Training Tesseract	210
	Retrieving CAPTCHAs and Submitting Solutions	213
14	Avoiding Scraping Traps	217
14.		217
	Titote on Lune	
		219
	, 1	
	28	223
	Common 10111 Course,	
	Thaten input reid values	225
	Avoiding Honeypots	
	The Human Checklist	220
15.	Testing Your Website with Scrapers	229
	An Introduction to Testing	229
	What Are Unit Tests?	230
	Python unittest	230
	Testing Wikipedia	232
	Testing with Selenium	235
	Interacting with the Site	235
	unittest or Selenium?	238
16.	Web Crawling in Parallel	241
	Processes versus Threads	241
	Multithreaded Crawling MOZI anieras	242
	Race Conditions and Queues	244
	The threading Module	247
	Multiprocess Crawling alga batta and poball patternus of	249
	Multiprocess Crawling	251
		253

	Multiprocess Crawling—Another Approach	255
17.	Scraping Remotely	257
	Why Use Remote Servers?	257
	Avoiding IP Address Blocking	258
	Portability and Extensibility	259
	Tor	259
	PySocks	261
	Remote Hosting	261
	Running from a Website-Hosting Account	262
	Running from the Cloud	263
	Additional Resources	264
18.	The Legalities and Ethics of Web Scraping	265
	Trademarks, Copyrights, Patents, Oh My!	265
	Copyright Law	266
	Trespass to Chattels	268
	The Computer Fraud and Abuse Act	270
	robots.txt and Terms of Service	271
	Three Web Scrapers	274
	eBay versus Bidder's Edge and Trespass to Chattels	274
	United States v. Auernheimer and The Computer Fraud and Abuse Act	276
	Field v. Google: Copyright and robots.txt	277
	Moving Forward	278
Inde	ж	281