

Graduate School of Science and Technology Master's Thesis Abstract

Laboratory name (Supervisor)	Software Engineering (Ken-ichi Matsumoto Professor)		
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Thesis title	Empirical Study on Extracting Practical Code Scenarios from Python Textbooks		
Abstract			
<p>Python is one of the most popular programming languages due to its versatility and its ability to cater to a diverse audience, including those in machine learning, data science, and web programming. However, this versatility can also be a double-edged sword, as it implies a multitude of learning scenarios that might overwhelm students. To explore these scenarios, we investigate how programming concepts are applied in practical coding scenarios introduced in Python textbooks. Our approach involves inferring the contents, including the learning scenarios, from their tables of contents. Our study includes the manual curation of 1,017 chapter titles from 76 Python textbooks. The results indicate that learning scenarios are prevalent, comprising around 39.5% of the titles' contents. We then categorized the scenario contents into four types: Application Programming Interfaces, Data and Processing, Graphical User Interfaces, and others. Additionally, we identified a list of 19 Python modules used in these different scenarios. Finally, we present a prototype of a system capable of providing learners and educators with practical scenarios based on the audience and the Python library.</p>			