OPEN SOURCE SOFTWARE DEVELOPMENT SERIES

Rapid GUI Programming with Python and Qt

The Definitive Guide to PyQt Programming



Mark Summerfield

Foreword by Phil Thompson, Creator of PyQt

Rapid GUI Programming with Python and Qt

Rapid GUI Programming with Python and Qt: The Definitive Guide to PyQt Programming

Table of Contents

Half Title

Title Page

Copyright Page

Contents

Foreword

Introduction

Part I: Python Programming

Chapter 1. Data Types and Data Structures

Executing Python Code

Variables and Objects

Numbers and Strings

Integers and Long Integers

Floats and Decimals

Bytestrings, Unicode Strings, and QStrings

Collections

Tuples

Lists

Dictionaries

Sets

Built-in Functions

Summary

Exercises

Chapter 2. Control Structures



Conditional Branching

Looping

List Comprehensions and Generators

Functions

Generator Functions

Using Keyword Arguments

Lambda Functions

Dynamic Function Creation

Partial Function Application

Exception Handling

Summary

Exercises

Chapter 3. Classes and Modules

Creating Instances

Methods and Special Methods

Static Data, and Static Methods and Decorators

Example: The Length Class

Collection Classes

Example: The OrderedDict Class

Inheritance and Polymorphism

Modules and Multifile Applications

Using the doctest Module

Summary

Exercises

Part II: Basic GUI Programming

Chapter 4. Introduction to GUI Programming

A Pop-Up Alert in 25 Lines

An Expression Evaluator in 30 Lines

A Currency Converter in 70 Lines

Signals and Slots

Summary



Exercise

Chapter 5. Dialogs

Dumb Dialogs

Standard Dialogs

Modal OK/Cancel-Style Dialogs

Smart Dialogs

Modeless Apply/Close-Style Dialogs

Modeless Live Dialogs

Summary

Exercise

Chapter 6. Main Windows

Creating a Main Window

Actions and Key Sequences

Resource Files

Creating and Using Actions

Restoring and Saving the Main Windows State

Handling User Actions

Handling File Actions

Handling Edit Actions

Handling Help Actions

Summary

Exercise

Chapter 7. Using Qt Designer

Designing User Interfaces

Implementing Dialogs

Testing Dialogs

Summary

Exercise

Chapter 8. Data Handling and Custom File Formats

Main Window Responsibilities

Data Container Responsibilities



Saving and Loading Binary Files

Writing and Reading Using QDataStream

Writing and Reading Using the pickle Module

Saving and Loading Text Files

Writing and Reading Using QTextStream

Writing and Reading Using the codecs Module

Saving and Loading XML Files

Writing XML

Reading and Parsing XML with PyQts DOM Classes

Reading and Parsing XML with PyQts SAX Classes

Summary

Exercise

Part III: Intermediate GUI Programming

Chapter 9. Layouts and Multiple Documents

Layout Policies

TabWidgets and StackedWidgets

Extension Dialogs

Splitters

Single Document Interface (SDI)

Multiple Document Interface (MDI)

Summary

Exercise

Chapter 10. Events, the Clipboard, and Drag and Drop

The Event-Handling Mechanism

Reimplementing Event Handlers

Using the Clipboard

Drag and Drop

Handling Custom Data

Summary

Exercise

Chapter 11. Custom Widgets



Using Widget Style Sheets

Creating Composite Widgets

Subclassing Built-in Widgets

Subclassing QWidget

Example: A Fraction Slider
Example: A Flow-Mixing Widget

Summary

Exercise

Chapter 12. Item-Based Graphics

Custom and Interactive Graphics Items

Animation and Complex Shapes

Summary

Exercise

Chapter 13. Rich Text and Printing

Rich Text Editing

Using QSyntaxHighlighter

A Rich Text Line Edit

Printing Documents

Printing Images

Printing Documents Using HTML and QTextDocument

Printing Documents Using QTextCursor and QTextDocument

Printing Documents Using QPainter

Summary

Exercise

Chapter 14. Model/View Programming

Using the Convenience ItemWidgets

Creating Custom Models

Implementing the View Logic

Implementing the Custom Model

Creating Custom Delegates

Summary



Exercise

Chapter 15. Databases

Connecting to the Database

Executing SQL Queries

Using Database Form Views

Using Database Table Views

Summary

Exercise

Part IV: Advanced GUI Programming

Chapter 16. Advanced Model/View Programming

Custom Views

Generic Delegates

Representing Tabular Data in Trees

Summary

Exercise

Chapter 17. Online Help and Internationalization

Online Help

Internationalization

Summary

Exercise

Chapter 18. Networking

Creating a TCP Client

Creating a TCP Server

Summary

Exercise

Chapter 19. Multithreading

Creating a Threaded Server

Creating and Managing Secondary Threads

Implementing a Secondary Thread



Summary

Exercise

This Is Not Quite the End

Appendix A: Installing

Installing on Windows

Installing on Mac OS X

Installing on Linux and Unix

Appendix B. Selected PyQt Widgets

Appendix C. Selected PyQt Class Hierarchies

Index

