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Portable Python Projects

Run Your Home on a Raspberry Pi

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Portable Python Projects

Run Your Home on a Raspberry Pi

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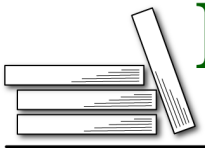

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Introduction

Welcome to the Pi. The journey ahead will guide you through the process of obtaining and configuring the right hardware and software to create unique and interesting applications.

A lot of books are written about the Pi, but nearly all of them focus on basic hardware and rudimentary electronics tasks that fail to showcase the power that the latest Pi hardware and add-ons have to offer. The base software we will configure on the Pi are the same applications used by world-class developers. And the projects we'll create offer a functional foundation that you can use to extend and customize for your own ideal applications.

The Raspberry Pi hardware has evolved considerably since its initial release in 2012. The fourth-generation design represents a major leap forward in bringing inexpensive yet powerful computers to the masses. The Pi 4 can support up to 8 GB RAM, which is twice as much as many desktops and laptops sold just a few years ago. More memory equates to more sophisticated applications running at the same time.

The syntax and structure of the Python language is easy to learn for beginners and yet is powerful enough for professional software developers to use every day. It is portable in that scripts written on one supported operating system can be reused with little or no changes on another OS.

The Raspberry Pi is also portable in that its size is smaller than a deck of playing cards, allowing it to be set up or easily relocated anywhere in your home or office. This is why the Pi is so popular among home-automation hobbyists. Thanks to the Pi's low-power CPU and robust compact design, it can be positioned behind a TV, near a washing machine and dryer, or even inside a light-switch compartment. As long as there's a power source and an Internet connection that the Pi can connect to, its location and use-case possibilities are endless.

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About the Book

The first part of the book introduces the Raspberry Pi computer, the peripherals required to effectively operate it, and a number of nifty sensors that provide the Pi with extended data processing capabilities. We'll also install the operating system and other software needed to prepare the Pi for the projects in the book.

The second part of the book contains the projects. Each project is similarly presented, starting with a brief introduction describing the objective. The Setup section contains all the additional hardware and accessories required to construct the project as well as any additional software libraries and packages needed for that project. The next sections walk you through the assembly of the components and the Python scripts needed to make them do something interesting. Projects conclude with a Next Steps section encouraging you to customize and expand the project foundation into a solution that ideally suits your needs.

Online Resources

The apps and examples shown in this book can be found at the Pragmatic Programmers website for this book.[1] There you will also find the errata-submission form, where you can report problems with the text or make suggestions for future versions.

In the next chapter, we'll review the shopping list of recommended hardware used in the book's projects. In addition to price and features, we'll also discuss the rationale for using one hardware configuration over another. So get ready for an educational, fun, practical, and rewarding experience ahead!

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1. http://pragprog.com/titles/mrpython/