Dedicated To

My Family

Who supported me thick and thinPreface

First of all, Congratulations on investing your hard earned money on this book. Who should read this book past this page?? A Techie by heart, A Hobbyist by nature & A Hacker by chance. Someone looking forward to have a rocking time with this magical box, labeled Raspberry Pi.

The Author was definitely as excited as you are right now to begin his hacking spree, but it was when I faced numerous challenges (both on Hardware and Software level), that I decided to capture my daily learning’s in the form of simple notes on notepad. And then, It all started, with my collection of simple notes to capture new learning’s, which has now taken the shape of a book.

The basic idea behind publishing this book, is to cut short the plethora of information available on various websites on how-to build System Image for Raspberry-Pi, and to help readers quickly jump to the practical stuff that matters, without wasting time and energy on.

All said and done, I would personally love to hear from you, your suggestions to make this book even better.

Regards,

Sudhanshu Gupta

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# About the Author

Sudhanshu Gupta (Founder – Softwares Unleashed), is a B.Tech in Electronics & Tele-Communications & M.S. in Softwares Systems, and has 13+years of experience in Telecom domain and Embedded Software development.

He had worked with Major Industry gaints, LG, Infineon, Intel to name a few. Sudhanshu during his stint with the corporate world, has contributed to numerous success stories of Big OEMs (LG, Samsung, Nokia)…cutting short the list.

He is now on a fast track to take his passion forward, ie. Application Development and Sharing his Technical Knowledge for the benefit of others.

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# About IoT

The Raspberry Pi is a series of credit card-sized single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools and in developing countries. Now over four years old, the Raspberry Pi, a cheap credit card sized computer, has taken the computing and DIY world by storm.

The original model became far more popular than anticipated, selling outside of its target market for uses such as robotics.

According to the Raspberry Pi Foundation, over 5 million Raspberry-Pi(s) have been sold before February 2015, making it the best-selling British computer.

#### Overview

Several generations of Raspberry-Pi(s) have been released. The first generation (Raspberry Pi 1 Model B) was released in February 2012. It was followed by a simpler and inexpensive model Model-A. In 2014, the foundation released a board with an improved design in Raspberry Pi 1 Model B+. The model laid the current "mainline" form-factor. Improved A+ and B+ models were released a year later. A cut down "compute module" was released in April 2014, and a Raspberry Pi Zero with smaller size and limited input/output (I/O) and general-purpose input/output (GPIO) abilities was released in November 2015 for US$5. The Raspberry Pi 2, which added more RAM, was released in February 2015. Raspberry Pi 3 Model B released in February 2016 is bundled with on-board WiFi and Bluetooth. As of December 2016, Raspberry Pi 3 Model B is the newest mainline Raspberry Pi. These boards are priced between US$5–35.

All models feature a Broadcom system on a chip (SoC), which includes an ARM compatible central processing unit (CPU) and an on chip graphics-processing unit (GPU, a VideoCore IV). CPU speed ranges from 700 MHz to 1.2 GHz for the Pi 3 and on board memory range from 256 MB to 1 GB RAM. Secure Digital (SD) cards are used to store the operating system and program memory in either the SDHC or MicroSDHC sizes. Most boards have between one and four USB slots, HDMI and composite video output, and a 3.5 mm phone jack for audio. Lower level output is provided by a number of GPIO pins which support common protocols like I²C. The B-models have an 8P8C Ethernet port and the Pi 3 has on board Wi-Fi 802.11n and Bluetooth.

The Foundation provides Raspbian, a Debian-based Linux distribution for download, as well as third party Ubuntu, Windows 10 IOT Core, RISC OS, and specialized media center distributions.[8] It promotes Python and Scratch as the main programming language, with support for many other languages. The default firmware is closed source, while an unofficial open source is available.

# IoT Projects

## 1) Cloud Temperature Monitor

Have you ever dreamt of controlling your home’s cooling/heating equipment, just to make that perfect ambience by the time you reach your home? All this and more, without you clicking a single button.

Monitoring the temperature of your home remotely, and that too without your intervention could be a bliss, not to mention the optimized communication between various IoT enabled devices, that help minimize your electricity bills.

Following pages will take you through

# Further Reference(s)

<http://elinux.org/RPi_Kernel_Compilation>

<http://elinux.org/RPiconfig>

<https://www.raspberrypi.org/>

<https://www.raspberrypi.org/resources/learn/>

<https://www.raspberrypi.org/documentation/linux/kernel/building.md>

<http://www.howtogeek.com/276468/how-to-use-a-raspberry-pi-as-a-networked-time-machine-drive-for-your-mac/>

<http://www.howtogeek.com/138281/the-htg-guide-to-getting-started-with-raspberry-pi/all/>

# Legends

RPi – Raspberry Pi

SoC – System on Chip

VC – Video Core