# BeagleBone Black
## Programming by Example

python

node

Agus Kurniawan

# Beaglebone Black Programming By Example

**Chris Simmonds**

**Beaglebone Black Programming By Example:**

   **BeagleBone Black Programming by Example** Agus Kurniawan, BeagleBone Black is a low cost community supported development platform for developers and hobbyists This book helps you to get started with BeagleBone Black development using Python and Node js with Debian Linux platform Several demo samples are be provided to accelerate your learning The following is highlight topics in this book Preparing Development Environment Basic Configuration Serial Debugging BeagleBone Black Programming Language BeagleBone Black I O Programming GPIO Analog I O PWM UART SPI I2C TWI Arduino Development Working with XBee IEEE 802 15 4 OpenCV Development       **BeagleBone Black Programming using Matlab** Agus Kurniawan,2015-10-15 MATLAB provides APIs to access BeagleBone Black board This book helps you to get started with BeagleBone Black Programming using Matlab The following the highlight Preparing Development Environment Setting up BeagleBone Black Development for MATLAB Working with GPIO Working with PWM and ADC Working with I2C Working with SPI Working with Serial Port Working with Web Camera Working with BeagleBone Black Linux Command Measuring and Plotting Sensor Data in Real Time     Effective Robotics Programming with ROS Anil Mahtani,Luis Sanchez,Enrique Fernandez,Aaron Martinez,2016-12-27 Find out everything you need to know to build powerful robots with the most up to date ROS About This Book This comprehensive yet easy to follow guide will help you find your way through the ROS framework Successfully design and simulate your 3D robot model and use powerful robotics algorithms and tools to program and set up your robots with an unparalleled experience by using the exciting new features from Robot Kinetic Use the latest version of gazebo simulator OpenCV 3 0 and C 11 standard for your own algorithms Who This Book Is For This book is suitable for an ROS beginner as well as an experienced ROS roboticist or ROS user or developer who is curious to learn ROS Kinetic and its features to make an autonomous Robot The book is also suitable for those who want to integrate sensors and embedded systems with other software and tools using ROS as a framework What You Will Learn Understand the concepts of ROS the command line tools visualization GUIs and how to debug ROS Connect robot sensors and actuators to ROS Obtain and analyze data from cameras and 3D sensors Use Gazebo for robot sensor and environment simulation Design a robot and see how to make it map the environment navigate autonomously and manipulate objects in the environment using MoveIt Add vision capabilities to the robot using OpenCV 3 0 Add 3D perception capabilities to the robot using the latest version of PCL In Detail Building and programming a robot can be cumbersome and time consuming but not when you have the right collection of tools libraries and more importantly expert collaboration ROS enables collaborative software development and offers an unmatched simulated environment that simplifies the entire robot building process This book is packed with hands on examples that will help you program your robot and give you complete solutions using open source ROS libraries and tools It also shows you how to use virtual machines and Docker containers to simplify the installation of Ubuntu and the ROS framework so you can start working in an isolated and control environment

without changing your regular computer setup It starts with the installation and basic concepts then continues with more complex modules available in ROS such as sensors and actuators integration drivers navigation and mapping so you can create an autonomous mobile robot manipulation Computer Vision perception in 3D with PCL and more By the end of the book you ll be able to leverage all the ROS Kinetic features to build a fully fledged robot for all your needs Style and approach This book is packed with hands on examples that will help you program your robot and give you complete solutions using ROS open source libraries and tools All the robotics concepts and modules are explained and multiple examples are provided so that you can understand them easily *BeagleBone By Example* Jayakarthigeyan Prabakar,2016-08-31 Learn how to build physical computing systems using BeagleBone Black and Python About This Book Get to grips with the fundamentals of BeagleBone Leverage Python scripts to program BeagleBone for your requirements Build four exciting projects from home automation to a tele controlled robot Who This Book Is For This book is intended for hobbyists and consumers who wish to create impressive projects using BeagleBone You must be familiar with Python programming What You Will Learn Program on BeagleBone Black using Python Interface sensors and actuators to BeagleBone Black Build your own real time physical computing systems Connect physical computing systems to cloud servers Build your own home automation and home security system Build your own tele controlled robot with real time video streaming In Detail BeagleBone is a low cost community supported development platform to develop a variety of electronic projects This book will introduce you to BeagleBone and get you building fun cool and innovative projects with it Start with the specifications of BeagleBone Black and its operating systems then get to grips with the GPIOs available in BeagleBone Black Work through four types of exciting projects building real time physical computing systems home automation image processing for a security system and building your own tele controlled robot and learn the fundamentals of a variety of projects in a single book By the end of this book you will be able to write code for BeagleBone in order to operate hardware and impart decision making capabilities with the help of efficient coding in Python Style and approach This book is a step by step guide that will walk you through the fundamentals of building different projects using BeagleBone Black _Programming the BeagleBone_ Yogesh Chavan,2016-01-28 Master BeagleBone programming by doing simple electronics and Internet of Things projects About This Book Quickly develop electronics projects that interact with Internet applications using JavaScript and Python Learn about electronics components such as sensors and motors and how to communicate with them by writing programs A step by step guide to explore the exciting world of BeagleBone from connecting BeagleBone to doing electronics projects and creating IoT applications Who This Book Is For If you want to learn programming on embedded systems with BeagleBone by doing simple electronics projects this book is for you This book is also helpful to BeagleBone owners who want to quickly implement small scale home automation solutions It is assumed that you have familiarity with C and Python programming Some familiarity with electronics is helpful but not essential What You Will Learn Connect your BeagleBone to a computer in

different ways and get the Cloud9 IDE running to quick start programming on the BeagleBone Get to know about BeagleBone extension pins such as GPIO and how to connect various electronics components with BeagleBone Read and write to various electronics components such as LED Push button sensors and motors Grasp in depth theory on Analog PWM and BUS programming and the electronics components used in programs Handle data to and from various BUS supporting modules such as UART I2C and SPI using the Adafruit BBIO Python library Write real life IoT applications in JavaScript and Python such as shooting an e mail on overheat and controlling a servo motor remotely Make use of online free cloud services to store and analyze sensor data collected on the BeagleBone Discover what else can be done using the BeagleBone Get to grips with embedded system BUS communication In Detail The whole world is moving from desktop computers to smartphones and embedded systems We are moving towards utilizing Internet of Things IoT An exponential rise in the demand for embedded systems and programming in the last few years is driving programmers to use embedded development boards such as Beaglebone BeagleBone is an ultra small cost effective computer that comes with a powerful hardware It runs a full fledged Debian Linux OS and provides numerous electronics solutions BeagleBone is open source and comes with an Ethernet port which allows you to deploy IoT projects without any additions to the board It provides plenty of GPIO Anlaog pins and UART I2C SPI pins which makes it the right choice to perform electronics projects This gives you all the benefits of Linux kernel such as multitasking multiusers and extensive device driver support This allows you to do programming in many languages including high level languages such as JavaScript and Python This book aims to exploit the hardware and software capabilities of BeagleBone to create real life electronics and IoT applications quickly It is divided into two parts The first part covers JavaScript programs The second part provides electronics projects and IoT applications in Python First you will learn to use BeagleBone as tool to write useful applications on embedded systems Starting with the basics needed to set up BeagleBone and the Cloud9 IDE this book covers interfacing with various electronics components via simple programs The electronics theory related to these components is then explained in depth before you use them in a program Finally the book helps you create some real life IoT applications Style and approach An easy to follow guide full of real world electronics programs and quick troubleshooting tips using BeagleBone All the required electronics concepts are explained in detail before using them in a program and all programs are explained in depth Most of the theory is covered in the first part while the second part gives you some quick programs BeagleBone Robotic Projects Richard Grimmett,2013-12-26 Develop practical example projects with detailed explanations combine the projects in a vast number of ways to create different robot designs or work through them in sequence to discover the full capability of the BeagleBone Black This book is for anyone who is curious about using new low cost hardware to create robotic projects that have previously been the domain of research labs major universities or Defence departments Some programming experience would be useful but if you know how to use a personal computer you can use this book to construct far more complex systems than you would have thought

possible **GNU/Linux Rapid Embedded Programming** Rodolfo Giometti,2017-03-29 An annotated guide to program and develop GNU Linux Embedded systems quickly Key Features Rapidly design and build powerful prototypes for GNU Linux Embedded systems Become familiar with the workings of GNU Linux Embedded systems and how to manage its peripherals Write monitor and configure applications quickly and effectively manage an external micro controller and use it as co processor for real time tasks Book DescriptionEmbedded computers have become very complex in the last few years and developers need to easily manage them by focusing on how to solve a problem without wasting time in finding supported peripherals or learning how to manage them The main challenge with experienced embedded programmers and engineers is really how long it takes to turn an idea into reality and we show you exactly how to do it This book shows how to interact with external environments through specific peripherals used in the industry We will use the latest Linux kernel release 4 4 x and Debian Ubuntu distributions with embedded distributions like OpenWrt and Yocto The book will present popular boards in the industry that are user friendly to base the rest of the projects on BeagleBone Black SAMA5D3 Xplained Wandboard and system on chip manufacturers Readers will be able to take their first steps in programming the embedded platforms using C Bash and Python PHP languages in order to get access to the external peripherals More about using and programming device driver and accessing the peripherals will be covered to lay a strong foundation The readers will learn how to read write data from to the external environment by using both C programs or a scripting language Bash PHP Python and how to configure a device driver for a specific hardware After finishing this book the readers will be able to gain a good knowledge level and understanding of writing configuring and managing drivers controlling and monitoring applications with the help of efficient quick programming and will be able to apply these skills into real world projects What you will learn Use embedded systems to implement your projects Access and manage peripherals for embedded systems Program embedded systems using languages such as C Python Bash and PHP Use a complete distribution such as Debian or Ubuntu or an embedded one such as OpenWrt or Yocto Harness device driver capabilities to optimize device communications Access data through several kinds of devices such as GPIO s serial ports PWM ADC Ethernet WiFi audio video I2C SPI One Wire USB and CAN Who this book is for This book targets Embedded System developers and GNU Linux programmers who would like to program Embedded Systems and perform Embedded development The book focuses on quick and efficient prototype building Some experience with hardware and Embedded Systems is assumed as is having done some previous work on GNU Linux systems Knowledge of scripting on GNU Linux is expected as well    *Mastering Embedded Linux Programming* Chris Simmonds,2017-06-30 Learn to confidently develop debug and deploy robust embedded Linux systems with hands on examples using BeagleBone and QEMU Key Features Step by step guide from toolchain setup to real time programming with hands on implementation Practical insights on kernel configuration device drivers and memory management Covers hardware integration using BeagleBone Black and virtual environments via QEMU Book DescriptionEmbedded Linux runs many of the devices we use

every day from smart TVs to WiFi routers test equipment to industrial controllers all of them have Linux at their heart Linux is a core technology in the implementation of the inter connected world of the Internet of Things You will begin by learning about the fundamental elements that underpin all embedded Linux projects the toolchain the bootloader the kernel and the root filesystem You ll see how to create each of these elements from scratch and how to automate the process using Buildroot and the Yocto Project Moving on you ll find out how to implement an effective storage strategy for flash memory chips and how to install updates to the device remotely once it is deployed You ll also get to know the key aspects of writing code for embedded Linux such as how to access hardware from applications the implications of writing multi threaded code and techniques to manage memory in an efficient way The final chapters show you how to debug your code both in applications and in the Linux kernel and how to profile the system so that you can look out for performance bottlenecks By the end of the book you will have a complete overview of the steps required to create a successful embedded Linux system What you will learn Evaluate the Board Support Packages offered by most manufacturers of a system on chip or embedded module Use Buildroot and the Yocto Project to create embedded Linux systems quickly and efficiently Update IoT devices in the field without compromising security Reduce the power budget of devices to make batteries last longer Interact with the hardware without having to write kernel device drivers Debug devices remotely using GDB and see how to measure the performance of the systems using powerful tools such as perk ftrace and valgrind Who this book is for This book is for embedded engineers Linux developers and computer science students looking to build real world embedded systems It suits readers who are familiar with basic Linux use and want to deepen their skills in kernel configuration debugging and device integration

Handbook of Research on Educational Technology Integration and Active Learning Keengwe, Jared,2015-05-31 As today s teachers prepare to instruct a new generation of students the question is no longer whether technology should be integrated into the classroom but only how Forced to combat shorter attention spans and an excess of stimuli teachers sometimes see technology as a threat rather than a potential enhancement to traditional teaching methods The Handbook of Research on Educational Technology Integration and Active Learning explores the need for new professional development opportunities for teachers and educators as they utilize emerging technologies to enhance the learning experience Highlighting the advancements of ubiquitous computing authentic learning and student centered instruction this book is an essential reference source for educators academics students researchers and librarians **BeagleBone Home Automation Blueprints** Rodolfo Giometti,2016-02-03 Automate and control your home using the power of the BeagleBone Black with practical home automation projects About This Book Build set up and develop your circuits via step by step tutorial of practical examples from initial board setup to device driver management Get access to several kinds of computer peripherals to monitor and control your domestic environment using this guide This book is spread across 10 chapters all focused on one practical home automation project Who This Book Is For This book is for developers who know how to use BeagleBone and

are just above the beginner level If you want to learn to use embedded machine learning capabilities you should have some experience of creating simple home automation projects What You Will Learn Build a CO and other gas sensor with a buzzer LED alarm to signal high concentrations Log environment data and plot it in a fancy manner Develop a simple web interface with a LAMP platform Prepare complex web interfaces in JavaScript and get to know how to stream video data from a webcam Use APIs to get access to a Google Docs account or a WhatsApp Facebook account to manage a home automation system Add custom device drivers to manage an LED with different blinking frequencies Discover how to work with electronic components to build small circuits Use an NFS temperature sensor relays and other peripherals to monitor and control your surroundings In Detail BeagleBone is a microboard PC that runs Linux It can connect to the Internet and can run OSes such as Android and Ubuntu BeagleBone is used for a variety of different purposes and projects from simple projects such as building a thermostat to more advanced ones such as home security systems Packed with real world examples this book will provide you with examples of how to connect several sensors and an actuator to the BeagleBone Black You ll learn how to give access to them in order to realize simple to complex monitoring and controlling systems that will help you take control of the house You will also find software examples of implementing web interfaces using the classical PHP HTML pair with JavaScript using complex APIs to interact with a Google Docs account WhatsApp or Facebook This guide is an invaluable tutorial if you are planning to use a BeagleBone Black in a home automation project Style and approach This step by step guide contains several home automation examples that can be used as base projects for tons of other home automation and control systems Through clear concise examples based on real life situations you will quickly get to grips with the core concepts needed to develop home automation applications with the BeagleBone Black using both the C language and high level scripting languages such as PHP Python and JavaScript     *JavaScript* Rheinwerk Publishing, Inc,Philip Ackermann,2024-09-18 Master JavaScript with this comprehensive guide covering everything from basics to advanced programming topics like asynchronous programming Node js and server side development Key Features Complete coverage of JavaScript from basics to advanced features Hands on web development and server side programming with Node js Specific focus on practical examples and asynchronous programming Book DescriptionThis book provides a comprehensive introduction to JavaScript and web development starting with the basics of programming and progressing through advanced topics The initial chapters introduce JavaScript exploring its history its relationship with HTML and CSS and how to integrate it into web pages Readers will learn to create and manipulate variables data types and operators while controlling the flow of programs using loops and functions As the book advances it covers more complex concepts like working with objects arrays and strings and introduces modern web APIs such as Ajax Fetch API and browser storage methods Additional chapters focus on object oriented and functional programming emphasizing JavaScript s versatile capabilities Later sections explore asynchronous programming server based applications with Node js and creating mobile and desktop applications using

frameworks like React Native and Electron There is also a focus on controlling microcontrollers using JavaScript automating tasks with Grunt and Gulp and managing source code through Git providing a full stack development approach with JavaScript at its core What you will learn Understand JavaScript basics Build dynamic web pages Use asynchronous programming Master object oriented programming Develop server side applications Create mobile and desktop apps Who this book is for This book is ideal for aspiring web developers software engineers and professionals looking to deepen their JavaScript knowledge Basic programming knowledge is helpful but the guide is also suitable for beginners eager to learn JavaScript and its practical applications      **Bad to the Bone** Steven F. Barrett,Jason Kridner,2022-11-10 This comprehensive book provides detailed materials for both novice and experienced programmers using all BeagleBone variants which host a powerful 32 bit super scalar TI Sitara ARM Cortex A8 processor Authored by Steven F Barrett and Jason Kridner a seasoned ECE educator along with the founder of Beagleboard org respectively the work may be used in a wide variety of projects from science fair projects to university courses and senior design projects to first prototypes of very complex systems Beginners may access the power of the Bone through the user friendly Bonescript examples Seasoned users may take full advantage of the Bone s power using the underlying Linux based operating system a host of feature extension boards Capes and a wide variety of Linux community open source libraries The book contains background theory on system operation coupled with many well documented illustrative examples Examples for novice users are centered on motivational fun robot projectswhile advanced projects follow the theme of assistive technology and image processing applications

**Exploring BeagleBone** Derek Molloy,2014-12-31 In depth instruction and practical techniques for building with the BeagleBone embedded Linux platform Exploring BeagleBone is a hands on guide to bringing gadgets gizmos and robots to life using the popular BeagleBone embedded Linux platform Comprehensive content and deep detail provide more than just a BeagleBone instruction manual you ll also learn the underlying engineering techniques that will allow you to create your own projects The book begins with a foundational primer on essential skills and then gradually moves into communication control and advanced applications using C C allowing you to learn at your own pace In addition the book s companion website features instructional videos source code discussion forums and more to ensure that you have everything you need The BeagleBone s small size high performance low cost and extreme adaptability have made it a favorite development platform and the Linux software base allows for complex yet flexible functionality The BeagleBone has applications in smart buildings robot control environmental sensing to name a few and expansion boards and peripherals dramatically increase the possibilities Exploring BeagleBone provides a reader friendly guide to the device including a crash course in computer engineering While following step by step you can Get up to speed on embedded Linux electronics and programming Master interfacing electronic circuits buses and modules with practical examples Explore the Internet connected BeagleBone and the BeagleBone with a display Apply the BeagleBone to sensing applications including video and sound Explore the

BeagleBone s Programmable Real Time Controllers Hands on learning helps ensure that your new skills stay with you allowing you to design with electronics modules or peripherals even beyond the BeagleBone Insightful guidance and online peer support help you transition from beginner to expert as you master the techniques presented in Exploring BeagleBone the practical handbook for the popular computing platform **Mastering BeagleBone Robotics** Richard Grimmett,2014-12-22 If you want a simple guide to building complex robots then this book is for you You ll need some programming knowledge and experience working with mechanical systems *BeagleBone Cookbook* Mark A. Yoder,Jason Kridner,2015-04-03 BeagleBone is an inexpensive web server Linux desktop and electronics hub that includes all the tools you need to create your own projects whether it s robotics gaming drones or software defined radio If you re new to BeagleBone Black or want to explore more of its capabilities this cookbook provides scores of recipes for connecting and talking to the physical world with this credit card sized computer All you need is minimal familiarity with computer programming and electronics Each recipe includes clear and simple wiring diagrams and example code to get you started If you don t know what BeagleBone Black is you might decide to get one after scanning these recipes Learn how to use BeagleBone to interact with the physical world Connect force light and distance sensors Spin servo motors stepper motors and DC motors Flash single LEDs strings of LEDs and matrices of LEDs Manage real time input output I O Work at the Linux I O level with shell commands Python and C Compile and install Linux kernels Work at a high level with JavaScript and the BoneScript library Expand BeagleBone s functionality by adding capes Explore the Internet of Things *Bad to the Bone* Steven Barrett,Jason Kridner,2022-06-01 BeagleBone Black is a low cost open hardware computer uniquely suited to interact with sensors and actuators directly and over the Web Introduced in April 2013 by BeagleBoard org a community of developers first established in early 2008 BeagleBone Black is used frequently to build vision enabled robots home automation systems artistic lighting systems and countless other do it yourself and professional projects BeagleBone variants include the original BeagleBone and the newer BeagleBone Black both hosting a powerful 32 bit super scalar ARM Cortex A8 processor capable of running numerous mobile and desktop capable operating systems typically variants of Linux including Debian Android and Ubuntu Yet BeagleBone is small enough to fit in a small mint tin box The Bone may be used in a wide variety of projects from middle school science fair projects to senior design projects to first prototypes of very complex systems Novice users may access the power of the Bone throughthe user friendly BoneScript software experienced through a Web browser in most major operating systems including Microsoft Windows Apple Mac OS X or the Linux operating systems Seasoned users may take full advantage of the Bone s power using the underlying Linux based operating system a host of feature extension boards Capes and a wide variety of Linux community open source libraries This book provides an introduction to this powerful computer and has been designed for a wide variety of users including the first time novice through the seasoned embedded system design professional The book contains background theory on system operation

coupled with many well documented illustrative examples Examples for novice users are centered on motivational fun robot projects while advanced projects follow the theme of assistive technology and image processing applications **The Book of I2C** Randall Hyde,2022-10-11 An extensive practical guide to connecting real world devices to microcontrollers with the popular I2C bus If you work with embedded systems you re bound to encounter the ubiquitous Inter Integrated Circuit bus IIC or I2C a serial protocol for connecting integrated circuits in a computer system In The Book of I2C the first comprehensive guide to this bus bestselling author Randall Hyde draws on 40 years of industry experience to get you started designing and programming I2C systems Aided by over 100 detailed figures and annotated source code listings you ll learn the I2C implementations of systems like Arduino Teensy and Raspberry Pi as well as variants of the I2C and common I2C peripheral ICs complete with programming examples For hardware hackers electronics hobbyists and software engineers of every skill level the extensive coverage in this book will make it a go to reference when it comes to connecting real world devices to I2C microcontrollers **30 BeagleBone Black Projects for the Evil Genius** Christopher Rush,2014-09-26 Fiendishly Fun Ways to Use the BeagleBone Black This wickedly inventive guide shows you how to program and build fun and fascinating projects with the BeagleBone Black You ll learn how to connect the BeagleBone Black to your computer and program it quickly mastering BoneScript and other programming tools so you can get started right away 30 BeagleBone Black Projects for the Evil Genius is filled with a wide variety of do it yourself LED sensor robotics display audio and spy gadgets You ll also get tips and techniques that will help you design your own ingenious devices Features step by step instructions and helpful illustrations Provides full schematic and breadboard layout diagrams for the projects Includes detailed programming code Removes the frustration factor all required parts are listed along with sources Build these and other clever creations High powered LED Morse code sender RGB LED fader GPS tracker Temperature sensor Light level indicator Web controlled rover Plant hydration system Sentinel turret 7 segment clock Display for sensor information Internet radio Imperial march indicator Intruder alert using Twitter API Lie detector Auto dog barker *BeagleBone: Creative Projects for Hobbyists* Charles Hamilton,Rodolfo Giometti,Richard Grimmett,2017-07-20 Learn to build amazing robotic projects using the powerful BeagleBone Black About This Book Push your creativity to the limit through complex diverse and fascinating projects Develop applications with the BeagleBone Black and open source Linux software Sharpen your expertise in making sophisticated electronic devices Who This Book Is For This Learning Path is aimed at hobbyists who want to do creative projects that make their life easier and also push the boundaries of what can be done with the BeagleBone Black This Learning Path s projects are for the aspiring maker casual programmer and budding engineer or tinkerer You ll need some programming knowledge and experience of working with mechanical systems to get the complete experience from this Learning Path What You Will Learn Set up and run the BeagleBone Black for the first time Get to know the basics of microcomputing and Linux using the command line and easy kernel mods Develop a simple web interface with a

LAMP platform Prepare complex web interfaces in JavaScript and get to know how to stream video data from a webcam Find out how to use a GPS to determine where your sailboat is and then get the bearing and distance to a new waypoint Use a wind sensor to sail your boat effectively both with and against the wind Build an underwater ROV to explore the underwater world See how to build an autonomous Quadcopter In Detail BeagleBone is a microboard PC that runs Linux It can connect to the Internet and run OSes such as Android and Ubuntu You can transform this tiny device into a brain for an embedded application or an endless variety of electronic inventions and prototypes This Learning Path starts off by teaching you how to program the BeagleBone You will create introductory projects to get yourselves acquainted with all the nitty gritty Then we ll focus on a series of projects that are aimed at hobbyists like you and encompass the areas of home automation and robotics With each project we ll teach you how to connect several sensors and an actuator to the BeagleBone Black We ll also create robots for land sea and water Yes really The books used in this Learning Path are BeagleBone Black Cookbook BeagleBone Home Automation Blueprints Mastering BeagleBone Robotics Style and approach This practical guide transforms complex and confusing pieces of technology to become accessible with easy to succeed instructions Through clear concise examples you will quickly get to grips with the core concepts needed to develop home automation applications with the BeagleBone Black **Learning BeagleBone Python Programming** Alexander Hiam,2015-07-14 BeagleBone is a barebone computer that can be configured and customized for different applications and is almost half the price of a standard computer This book will cover the basics of how BeagleBone Black s hardware interface subsystems work and can be controlled using two popular Python libraries for BeagleBone Black You will be introduced to BeagleBone Black s GPIO PWM ADC UART SPI I2C and eQEP subsystems We will then dive deep into more complex built in peripherals demonstrating different ways to receive input from a user including buttons potentiometers and rotary encoders with the eQEP module We will also learn about interfacing with external devices this will be demonstrated using the serial modules to interface with external devices such as temperature sensors and accelerometers Towards the end of the book we will present a couple of real world problems and demonstrate how to solve them with the skills you ve acquired

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**Beaglebone Black Programming By Example Introduction**

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