

Using A Ds1307 With A Pic Microcontroller Application

Beginning Arduino Programming allows you to quickly and intuitively develop your programming skills through sketching in code. This clear introduction provides you with an understanding of the basic framework for developing Arduino code, including the structure, syntax, functions, and libraries needed to create future projects. You will also learn how to program your Arduino interface board to sense the physical world, to control light, movement, and sound, and to create objects with interesting behavior. With Beginning Arduino Programming, you'll get the knowledge you need to master the fundamental aspects of writing code on the Arduino platform, even if you have never before written code. It will have you ready to take the next step: to explore new project ideas, new kinds of hardware, contribute back to the open source community, and even take on more programming languages.

Beginning Sensor Networks with Arduino and Raspberry Pi teaches you how to build sensor networks with Arduino, Raspberry Pi, and XBee radio modules, and even shows you how to turn your Raspberry Pi into a MySQL database server to store your sensor data! First you'll learn about the different types of sensors and sensor networks, including how to build a simple XBee network. Then you'll walk through building an Arduino-based temperature sensor and data collector, followed by building a Raspberry Pi-based sensor node. Next you'll learn different ways to store sensor data, including writing to an SD card, sending data to the cloud, and setting up a Raspberry Pi MySQL server to host your data. You even learn how to connect to and interact with a MySQL database server directly from an Arduino! Finally you'll learn how to put it all together by connecting your Arduino sensor node to your new Raspberry Pi database server. If you want to see how well Arduino and Raspberry Pi can get along, especially to create a sensor network, then Beginning Sensor Networks with Arduino and Raspberry Pi is just the book you need.

This book introduces the problems facing Internet of Things developers and explores current technologies and techniques to help you manage, mine, and make sense of the data being collected through the use of the world's most popular database on the Internet - MySQL. The IoT is poised to change how we interact with and perceive the world around us, and the possibilities are nearly boundless. As more and more connected devices generate data, we will need to solve the problem of how to collect, store, and make sense of IoT data by leveraging the power of database systems. The book begins with an introduction of the MySQL database system and storage of sensor data. Detailed instructions and examples are provided to show how to add database nodes to IoT solutions including how to leverage MySQL high availability, including examples of how to protect data from node outages using advanced features of MySQL. The book closes with a comparison of raw and transformed data showing how transformed data can improve understandability and help you cut through a clutter of superfluous data toward the goal of mining nuggets of useful knowledge. In this book, you'll learn to: Understand the crisis of vast volumes of data from connected devices Transform data to improve reporting and reduce storage volume Store and aggregate your IoT data across multiple database servers Build localized, low-cost MySQL database servers using small and inexpensive computers Connect Arduino boards and other devices directly to MySQL database servers Build high availability MySQL solutions among

low-power computing devices

150 Projects With Arduino

SD Card Projects Using the PIC Microcontroller

Mastering the Raspberry Pi

Hands-On IoT: Wi-Fi and Embedded Web Development

Top 200 Arduino Project

Banana Pro Blueprints

Computational Science and Its Applications – ICCSA 2022 Workshops

This book offers a collection of selected papers presented at the Seventh International Conference on ICT Innovations held in October 2015, in Ohrid, Macedonia, with main topic Emerging Technologies for Better Living. The conference gathered academics, professionals and industrial practitioners that work on developing the emerging technologies, systems, applications in the industrial and business arena especially innovative commercial implementations, novel application of technology, and experience in applying recent ICT research advances to practical solutions.

PIC Microcontrollers are a favorite in industry and with hobbyists. These microcontrollers are versatile, simple, and low cost making them perfect for many different applications. The 8-bit PIC is widely used in consumer electronic goods, office automation, and personal projects. Author, Dogan Ibrahim, author of several PIC books has now written a book using the PIC18 family of microcontrollers to create projects with SD cards. This book is ideal for those practicing engineers, advanced students, and PIC enthusiasts that want to incorporate SD Cards into their devices. SD cards are cheap, fast, and small, used in many MP3 players, digital and video cameras, and perfect for microcontroller applications. Complete with Microchip's C18 student compiler and using the C language this book brings the reader up to speed on the PIC 18 and SD cards, knowledge which can then be harnessed for hands-on work with the eighteen projects included within. Two great technologies are brought together in this one practical, real-world, hands-on cookbook perfect for a wide range of PIC fans. Eighteen fully worked SD projects in the C programming language Details memory cards usage with the PIC18 family

Quickly learn to program for microcontrollers and IoT devices without a lot of study and expense. MicroPython and controllers that support it eliminate the need for programming in a C-like language, making the creation of IoT applications and devices easier and more accessible than ever. MicroPython for the Internet of Things is ideal for readers new to electronics and the world of IoT. Specific examples are provided covering a range of supported devices, sensors, and MicroPython boards such as Pycom's WiPy modules and MicroPython's pyboard. Never has programming for microcontrollers been easier. The book takes a practical and hands-on approach without a lot of detours into the depths of theory. The book: Shows a faster and easier way to program microcontrollers and IoT devices Teaches MicroPython, a variant of one of the most widely used scripting languages Is friendly and accessible to those new to electronics, with fun example projects What You'll Learn Program in MicroPython Understand sensors and basic electronics Develop your own IoT projects Build applications for popular boards such as WiPy and pyboard Load MicroPython on the ESP8266 and similar boards Interface with hardware breakout boards Connect hardware to software through MicroPython Explore the easy-to-use Adafruit IO connecting your microcontroller to the cloud Who This Book Is For Anyone interested in building IoT solutions without the heavy burden of programming in C++ or C. The book also appeals to those wanting an easier way to work with hardware than is provided by the Arduino and the Raspberry Pi platforms.

Need some inspiration for your Raspberry Pi projects? Wondering how to work with Wii nunchucks, stepper motors, how to create a remote control panel? If you need guidance, Experimenting with Raspberry Pi is your own personal idea generator. Experimenting with Raspberry Pi covers how to work with various components and hardware like humidity and temperature sensors, Wii nunchucks, GPIO extenders, and IR receivers so you can add these to your own projects. Written with budgets in mind, author Warren Gay encourages you to build, experiment, and swap out various parts to learn more about the Pi and come up with the best ideas and instructions for your own amazing Raspberry Pi project ideas.

... Africon Conference in Africa

LTE Cellular Narrowband Internet of Things (NB-IoT)

ICCAI 2021

Near Field Communication with Arduino, Android, and PhoneGap

Create versatile and robust embedded solutions for MCUs and RTOses with modern C++

Advanced Informatics for Computing Research

The Department of Electronics and Communication Engineering of KIET Group of Institutions, Delhi-NCR organized the 4th International Conference ICCE-2020 during November 28-29, 2020. Information compiled in this book is based on the 114 research papers of excellent quality covering different domains of Electronics and Communication Engineering, Computer Science Engineering, Information Technology, Electrical Engineering, Electronics and Instrumentation Engineering. The subject areas treated in the book are: Satellite, Radar and Microwave Techniques, Secure, Smart, and Reliable Networks, Next Generation Networks, Devices & Circuits, Signal & Image Processing, New Emerging Technologies, having the central focus on Recent Trends in Communication & Electronics (ICCE-2020). In addition, a few themes based on Special Sessions have also been conducted in ICCE-2020. The objective of the book resulting from the 4th International Conference on Recent Trends in Communication & Electronics (ICCE-2020) is to provide a resource for the study and research work for an interested audience comprising of researchers, students, audience, and practitioners in the areas of Communications & Computing Systems.

This book is a collection of papers from the 2009 International Conference on Signals, Systems and Automation (ICSSA 2009). The conference at a glance: - Pre-conference Workshops/Tutorials on 27th Dec, 2009 - Five Plenary talks - Paper/Poster Presentation: 28-29 Dec, 2009 - Demonstrations by SKYVIEWInc, SLS Inc., BSNL, Baroda Electric Meters, SIS - On line paper submission facility on website - 200+ papers are received from India and abroad - Delegates from different countries including Poland, Iran, USA - Delegates from 16 states of India - Conference website is seen by more than 3000 persons across the world (27 countries and 120 cities)

You probably already know that the Raspberry Pi is an excellent teaching tool. If you want to teach Linux basics or Python programming or basic electronics, it's a great place to start. But what if you are an electronics engineer or a Linux systems administrator or a very experienced maker? You want to know all of the details and inner working of the Raspberry Pi -- how to (figuratively or maybe even literally) make it get up and dance without wading through basics and introductory material. If you want to get right into the pro-level guts of the Raspberry Pi, complete with schematics, detailed hardware explanations, messing around with runlevels, reporting voltages and temperatures, and recompiling the kernel, then Mastering the Raspberry Pi is just the book you need. Along with all of the thorough explanations of hardware and operating system, you'll also get a variety of project examples and explanations that you can tune for your own project ideas. You'll find yourself turning to Mastering the Raspberry Pi over and over again for both inspiration and reference. Whether you're an electronics professional, an entrepreneurial maker, or just looking for more detailed information on the Raspberry Pi, this is exactly the book for you.

Expand Raspberry Pi capabilities with fundamental engineering principles Exploring Raspberry Pi is the innovators guide to bringing Raspberry Pi to life. This book favors engineering principles over a 'recipe' approach to give you the skills you need to design and build your own projects. You'll understand the fundamental principles in a way that transfers to any type of electronics, electronic modules, or external peripherals, using a "learning by doing" approach that caters to both beginners and experts. The book begins with basic Linux and programming skills, and helps you stock your inventory with common parts and supplies. Next, you'll learn how to make parts work together to achieve the goals of your project, no matter what type of components you use. The companion website provides a full repository that structures all of the code and scripts, along with links to video tutorials and supplementary content that takes you deeper into your project. The Raspberry Pi's most famous feature is its adaptability. It can be used for thousands of electronic applications, and using the Linux OS expands the functionality even more. This book helps you get the most from your Raspberry Pi, but it also gives you the fundamental engineering skills you need to incorporate any electronics into any project. Develop the Linux and programming skills you need to build basic applications Build your inventory of parts so you can always "make it work" Understand interfacing, controlling, and communicating with almost any component Explore advanced applications with video, audio, real-world interactions, and more Be free to adapt and create with Exploring Raspberry Pi.

A Handbook for Technicians, Engineers, and Makers

Arduino Cookbook

4th International Conference, ICAICR 2020, Gurugram, India, December 26-27, 2020, Revised Selected Papers, Part II

Proceedings of International Conference on Communication and Artificial Intelligence

MicroPython for the Internet of Things

Raspberry Pi Cookbook

Want to light up a display? Control a touch screen? Program a robot? The Arduino is a microcontroller board that can help you do all of these things, plus nearly anything you can dream up. Even better, it's inexpensive and, with the help of Beginning Arduino, Second Edition, easy to learn. In Beginning Arduino, Second Edition, you will learn all about the popular Arduino by working your way through a set of 50 cool projects. You'll progress from a complete Arduino beginner to intermediate Arduino and electronic skills and the confidence to create your own amazing projects. You'll also learn about the newest Arduino boards like the Uno and the Leonardo along the way. Absolutely no experience in programming or electronics required! Each project is designed to build upon the knowledge learned in earlier projects and to further your knowledge of Arduino programming and electronics. By the end of the book you will be able to create your own projects confidently and with creativity. You'll learn about: Controlling LEDs Displaying text and graphics on LCD displays Making a line-following robot Using digital pressure sensors Reading and writing data to SD cards Connecting your Arduino to the Internet This book is for electronics enthusiasts who are new to the Arduino as well as artists and hobbyists who want to learn this very popular platform for physical computing and electronic art. Please note: The print version of this title is black and white; the eBook is full color. The color fritzing diagrams are available in the source code downloads on <http://www.apress.com/9781430250166>

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 Updated to cover the latest Beagle boards, Linux kernel versions, and Linux software releases. Includes new content on Linux kernel development, the Linux Remote Processor Framework, CAN bus, IoT frameworks, and much more! 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.

Recent advancements in technology have led to significant improvements in designing various electronic systems. This provides a wide range of different components that can be utilized across numerous applications. Microcontroller System Design Using PIC18F Processors provides comprehensive discussions on strategies and techniques for optimizing microprocessor-based electronic system development and examines methods for acquiring improved software and hardware skills. Highlighting innovative concepts across a range of topics, such as serial peripheral interfaces, addressing modes, and asynchronous communications, this book is an ideal information source for professionals, researchers, academics, engineers, practitioners, and programmers.

this book is about how to assy the circuit using Arduino, especially the datalogger using adafruit series

Practical Projects for the Cloud and Data Visualization

Exploring Arduino

Beginning Sensor Networks with Arduino and Raspberry Pi

Raspberry Pi

Tools and Techniques for Building with Embedded Linux

Beginning Arduino Programming

The world of Raspberry Pi is evolving quickly, with many new interface boards and software libraries becoming available all the time. In this cookbook, prolific hacker and author Simon Monk provides more than 200 practical recipes for running this tiny low-cost computer with Linux, programming it with Python, and hooking up sensors, motors, and other hardware—including Arduino. You'll also learn basic principles to help you use new technologies with Raspberry Pi as its ecosystem develops. Python and other code examples from the book are available on GitHub. This cookbook is ideal for programmers and hobbyists familiar with the Pi through resources such as Getting Started with Raspberry Pi (O'Reilly). Set up and manage your Raspberry Pi Connect the Pi to a network Work with its Linux-based operating system Use the Pi's ready-made software Program Raspberry Pi with Python Control hardware through the GPIO connector Use Raspberry Pi to run different types of motors Work with switches, keypads, and other digital inputs Hook up sensors for taking various measurements Attach different displays, such as an LED matrix Create dynamic projects with Raspberry Pi and Arduino Make sure to check out 10 of the over 60 video recipes for this book at: <http://razzpisampler.oreilly.com/> You can purchase all recipes at:

The bestselling beginner Arduino guide, updated with new projects! Exploring Arduino makes electrical engineering and embedded software accessible. Learn step by step everything you need to know about electrical engineering, programming, and human-computer interaction through a series of increasingly complex projects. Arduino guru Jeremy Blum walks you through each build, providing code snippets and schematics that will remain useful for future projects. Projects are accompanied by downloadable source code, tips and tricks, and video tutorials to help you master Arduino. You'll gain the skills you need to develop your own microcontroller projects! This new 2nd edition has been updated to cover

the rapidly-expanding Arduino ecosystem, and includes new full-color graphics for easier reference. Servo motors and stepper motors are covered in richer detail, and you'll find more excerpts about technical details behind the topics covered in the book. Wireless connectivity and the Internet-of-Things are now more prominently featured in the advanced projects to reflect Arduino's growing capabilities. You'll learn how Arduino compares to its competition, and how to determine which board is right for your project. If you're ready to start creating, this book is your ultimate guide! Get up to date on the evolving Arduino hardware, software, and capabilities Build projects that interface with other devices—wirelessly! Learn the basics of electrical engineering and programming Access downloadable materials and source code for every project Whether you're a first-timer just starting out in electronics, or a pro looking to mock-up more complex builds, Arduino is a fantastic tool for building a variety of devices. This book offers a comprehensive tour of the hardware itself, plus in-depth introduction to the various peripherals, tools, and techniques used to turn your little Arduino device into something useful, artistic, and educational. Exploring Arduino is your roadmap to adventure—start your journey today!

Arduino is the open source electronics prototyping platform that has taken the Maker Movement by storm. This thorough introduction, updated for the latest Arduino release, helps you start prototyping right away. From obtaining the required components to putting the final touches on your project, all the information you need is here! Getting started with Arduino is a snap. To use the introductory examples in this guide, all you need is an Arduino Uno or Leonardo, along with a USB cable and an LED. The easy-to-use, free Arduino development environment runs on Mac, Windows, and Linux. In Getting Started with Arduino, you'll learn about: Interaction design and physical computingThe Arduino board and its software environmentBasics of electricity and electronicsPrototyping on a solderless breadboardDrawing a schematic diagramTalking to a computer--and the cloud--from ArduinoBuilding a custom plant-watering system

Presents an introduction to the open-source electronics prototyping platform.

Microcontroller System Design Using PIC18F Processors

Interfacing to the Real World with Embedded Linux

Exploring Raspberrry Pi

Hands-On Embedded Programming with C++17

Internet of Things with 8051 and ESP8266

Beginning NFC

Rather than yet another project-based workbook, Arduino: A Technical Reference is a reference and handbook that thoroughly describes the electrical and performance aspects of an Arduino board and its software. This book brings together in one place all the information you need to get something done with Arduino. It will save you from endless web searches and digging through translations of datasheets or notes in project-based texts to find the information that corresponds to your own particular setup and question. Reference features include pinout diagrams, a discussion of the AVR microcontrollers used with Arduino boards, a look under the hood at the firmware and run-time libraries that make the Arduino unique, and extensive coverage of the various shields and add-on sensors that can be used with an Arduino. One chapter is devoted to creating a new shield from scratch. The book wraps up with detailed descriptions of three different projects: a programmable signal generator, a "smart" thermostat, and a programmable launch sequencer for model rockets. Each project highlights one or more topics that can be applied to other applications.

This book includes selected papers presented at the 4th International Conference on Data Engineering and Communication Technology (ICDECT 2020), held at Kakatiya Institute of Technology & Science, Warangal, India, during 25-6 September 2020. It features advanced, multidisciplinary research towards the design of smart computing, information systems and electronic systems. It also focuses on various innovation paradigms in system knowledge, intelligence and sustainability which can be applied to provide viable solutions to diverse problems related to society, the environment and industry.

This book highlights recent research on bio-inspired computing and its various innovative applications in information and communication technologies. It presents 51 high-quality papers from the 11th International Conference on Innovations in Bio-Inspired Computing and Applications (IBICA 2020) and 10th World Congress on Information and Communication Technologies (WICT 2020), which was held online during December 16–18, 2019. As a premier conference, IBICA-WICT brings together researchers, engineers and practitioners whose work involves bio-inspired computing, computational intelligence and their applications in information security, real-world contexts, etc. Including contributions by authors from 25 countries, the book offers a valuable reference guide for all researchers, students and practitioners in the fields of Computer Science and Engineering.

Experimenting with Raspberry PIApress

Getting Started With Arduino

Malaga, Spain, July 4-7, 2022, Proceedings, Part V

Practical Raspberry Pi

Proceedings of the 11th International Conference on Innovations in Bio-Inspired Computing and Applications (IBICA 2020) held during December 16-18, 2020

A Beginner's Guide to Programming with Python on Microcontrollers

Proceedings

Rapid advances in IoT technology demand a lot of devices to be connected to the internet. To design such devices, we usually need knowledges about microcontrollers and computer network. As an example, we often found devices that can be connected to the network and can be configured via web interfaces. These devices implement embedded web server. For example, most of network devices usually use embedded web server as the interface for configuration. Although there are a lot of books that discuss about microcontrollers or web development, they usually discuss the topics in separate books. Rarely, there is a book that discusses both of the topics in one book, i.e. the book that discusses how to create a web interface for a microcontroller. Therefore, this book is written to fill that gap. The Arduino library is used to program the ESP32, while HTML, CSS, and JavaScript are used to build the web interface.

The Raspberrry Pi is an inexpensive, simple computer that's about the size of a credit card. At first glance, it looks like a simple circuit board with a few inputs and outputs, but the Raspberrry Pi is actually a computer with multiple inputs and outputs that make it the foundation for an almost limitless number of projects - from creating a wireless internet streaming radio, to creating a wi-fi hot spot, to creating elaborate, programmed LED light shows - it's all been done. The real power of the RPI is that it's simple, cheap, and users can build all kinds of useful and fun projects using a few simple tools, some basic programming, and a ton of imagination. Idiot's Guides: Raspberrry Pi is the perfect beginner book for learning how the Raspberrry Pi works, how to program it, how to connect it to existing devices to enhance or even hack their existing functionality, and how to put together some basic first projects from scratch. Readers will learn how to download and use the right software for the job, how to program using Scratch (a basic language for programming Linux), and how to come up with their own crazy project ideas for creating virtually anything that requires nothing more than processing power from a simple computer.

Jump into the world of Near Field Communications (NFC), the fast-growing technology that lets devices in close proximity exchange data, using radio signals. With lots of examples, sample code, exercises, and step-by-step projects, this hands-on guide shows you how to build NFC applications for Android, the Arduino microcontroller, and embedded Linux devices. You'll learn how to write apps using the NFC Data Exchange Format (NDEF) in PhoneGap, Arduino, and node.js that help devices read messages from passive NFC tags and exchange data with other NFC-enabled devices. If you know HTML and JavaScript, you're ready to start with NFC. Dig into NFC's architecture, and learn how it's related to RFID Write sample apps for Android with PhoneGap and its NFC plugin Dive into NDEF: examine existing tag-writer apps and build your own Listen for and filter NDEF messages, using PhoneGap event listeners Build a full Android app to control lights and music in your home Create a hotel registration app with Arduino, from check-in to door lock Write peer-to-peer NFC messages between two Android devices Explore embedded Linux applications, using examples on Raspberrry Pi and BeagleBone

This book provides alternative approach to access Raspberrry Pi I/O using Python. It describes how to work with Raspberrry Pi I/O and illustrates their use with code examples in Python. The following is highlight topics in book: * Setup Development Environment * Hello Raspberrry Pi I/O and Python

* Raspberrry Pi GPIO * Raspberrry Pi UART * Raspberrry Pi I2C * Raspberrry Pi SPI * Working with DAC and ADC on Raspberrry Pi

Tools and Techniques for Engineering Wizardry

Proceedings of ICDECT 2020

150 Projects With Arduino

Experimenting with Raspberrry Pi

ICT Innovations 2015

Nuts & Volts

Build safety-critical and memory-safe stand-alone and networked embedded systems Key FeaturesKnow how C++ works and compares to other languages used for embedded developmentCreate advanced GUIs for embedded devices to design an attractive and functional UIIntegrate proven strategies into your design for optimum hardware performanceBook Description C++ is a great choice for embedded development, most notably, because it does not add any bloat, extends maintainability, and offers many advantages over different programming languages. Hands-On Embedded Programming with C++17 will show you how C++ can be used to build robust and concurrent systems that leverage the available hardware resources. Starting with a primer on embedded programming and the latest features of C++17, the book takes you through various facets of good programming. You'll learn how to use the concurrency, memory management, and functional programming features of C++ to build embedded systems. You will understand how to integrate your systems with external peripherals and efficient ways of working with drivers. This book will also guide you in testing and optimizing code for better performance and implementing useful design patterns. As an additional benefit, you will see how to work with Qt, the popular GUI library used for building embedded systems. By the end of the book, you will have gained the confidence to use C++ for embedded programming. What you will learnChoose the correct type of embedded platform to use for a projectDevelop drivers for OS-based embedded systemsUse concurrency and memory management with various microcontroller units (MCUs)Debug and test cross-platform code with LinuxImplement an infotainment system using a Linux-based single board computerExtend an existing embedded system with a Qt-based GUICommunicate with the FPGA side of a hybrid FPGA/SoC systemWho this book is for If you want to start developing effective embedded programs in C++, then this book is for you. Good knowledge of C++ language constructs is required to understand the topics covered in the book. No knowledge of embedded systems is assumed.

This book was written with the novice or intermediate 8052 developer in mind. Assuming no prior knowledge of the 8052, it takes the reader step-by-step through the architecture including discussions and explanations of concepts such as internal RAM, external RAM, Special Function Registers (SFRs), addressing modes, timers, serial I/O, and interrupts. This is followed by an in-depth section on assembly language which explains each instruction in the 8052 instruction set as well as related concepts such as assembly language syntax, expressions, assembly language directives, and how to implement 16-bit mathematical functions. The book continues with a thorough explanation of the 8052 hardware itself, reviewing the function of each pin on the microcontroller and follows this with design and explanation of a fully functional single board computer--every section of the schematic design is explained in detail to provide the reader with a full understanding of how everything is connected, and why. The book closes with a section on hardware interfacing and software examples in which the reader will learn about the SBCMON monitor program for use on the single board computer interfacing with a 4x4 keypad, communicating with a 16x2 LCD in direct-connect as well as memory-mapped fashion, utilizing an external serial EEPROM via the SPI protocol, and using the I2C communication standard to access an external real time clock. The book takes the reader with absolutely no knowledge of the 8052 and provides him with the information necessary to understand the architecture, design and build a functioning circuit based on the 8052, and write software to operate the 8052 in assembly language.

Leverage the capability of Banana Pi with exciting real-world projects About This Book Delve into the expanse of Banana Pi's self-managing functionalities and develop real-world projects Gain hands-on experience of developing various wireless, multimedia, robotic, and sensor-based applications with Banana Pi Develop your applications using Banana Pi through a project-based approach Who This Book Is For This book is designed for those who are interested in exploring the capabilities of Banana Pro. Basic know-how of Linux and embedded systems would be an added advantage. What You Will Learn Remotely connect to Banana Pro and program the embedded board Use Banana Pro as a hotspot or provide an AirPlay server for wireless audio transmission Find out about the different programming languages that can be used with Banana Pro Build and program your own multimedia centre in order to watch television and movies Connect peripherals such as a camera, LCD, or hard disk to Banana Pro Manage and regulate your Linux system with Banana Pro Stream music wirelessly from your mobile phone to Banana Pro In Detail This book follows a tactical plan that will guide you through the implementation of Banana Pro and its configurations. You will then learn the various programming languages used with Banana Pi with the help of examples. In no time at all, you'll be working on a wireless project that implements AirPlay servers, hotspots, and so on. Following this, you'll develop a retro-style arcade kiosk game. Then we'll move on to explore the multimedia features of Banana Pro by designing and building an enclosure for it. After this, you'll learn to build a remote-controlled smart car and we'll examine how to control a robotic arm. The book will conclude with the creation of a home sensor system that has the ability to expand or shrink to suit any home. Style and approach This book follows a project-based approach that covers the most important features of Banana Pro. Every chapter dives into the practical side of the implementation.

NB-IoT is the Internet of Things (IoT) technology used for cellular communication. NB-IoT devices deliver much better capability and performance, such as: increased area coverage of up to one kilometer; a massive number of devices—up to 200,000—per a single base-station area; longer battery lifetime of ten years; and better indoor and outdoor coverage for areas with weak signal, such as underground garages. The cellular NB-IoT technology is a challenging technology to use and understand. With more than 30 projects presented in this book, covering many use cases and scenarios, this book provides hands-on and practical experience of how to use the cellular NB-IoT for smart applications using ArduinoTM, Amazon Cloud, Google Maps, and charts. The book starts by explaining AT commands used to configure the NB-IoT modem: data serialization and deserialization; how to set up the cloud for connecting NB-IoT devices; setting up rules, policy, security certificates, and a NoSQL database on the cloud; how to store and read data in the cloud; how to use Google Maps to visualize NB-IoT device geo-location; and how to use charts to visualize sensor datasets. Projects for Arduino are presented in four parts. The first part explains how to connect the device to the mobile operator and cellular network; perform communication using different network protocols, such as TCP, HTTP, SSL, or MQTT; how to use GPS for geo-location applications; and how to upgrade NB-IoT modem firmware over the air. The second part explains the microcontroller unit and how to build and run projects, such as a 7-segment display or a real-time clock. The third part explains how NB-IoT can be used with sensor devices, such as ultrasonic and environmental sensors. Finally, the fourth part explains how NB-IoT can be used to control actuators, such as stepper motors and relays. This book is a unique resource for understanding practical uses of the NB-IoT technology and serves as a handbook for technical and non-technical readers who are looking for practicing and exercising the cellular NB-IoT technology. The book can be used by engineers, students, researchers, system integrators, mobile operators' technical staff, and electronics enthusiasts. To download the software which can be used with the book, go to: https://github.com/5ghub/NB-IoT About the Author: Hossain Fattah is a technology expert in 4G/5G wireless systems and networking. He received his Ph.D. in Electrical and Computer Engineering from University of British Columbia, Vancouver, Canada in 2003. He received his Master of Applied Science in Electrical and Computer Engineering from University of Victoria, Victoria, Canada in 2000. He completed his B.Sc. degree in Computers and Systems Engineering from Al-Azhar University, Cairo, Egypt in 1995. Between 2003 and 2011, he was in academia and industry, including Texas A&M University. Between 2011 and 2013, he was with Spirent Communications, NJ, USA. Since 2013, he has been with Microsoft, USA. He is also an affiliate associate professor at University of Washington, Tacoma, WA, USA, teaching graduate courses on IoT and distributed systems and collaborating on 5G research and innovations. He has had many patents and technical publications in conferences and journals. He is a registered professional Engineer with the Association of Professional Engineers, British Columbia, Canada. He is the author of the recent book 5G LTE Narrowband Internet of Things (NB-IoT). His research interest is in wireless communications and radio networks and protocols, cellular quality of service, radio resource management, traffic and packet scheduling, network analytics, and mobility.

Innovations in Bio-Inspired Computing and Applications

DATALOGGER DATALOGGER

Developing with ESP32, Arduino, C/C++, HTML, CSS, and JavaScript by Examples

IEEE Africon

Exploring BeagleBone

Practical Raspberrry Pi takes you quickly through the hardware and software basics of the Raspberrry Pi. Author Brendan Horan then gets you started on a series of fun and practical projects, including a simple temperature sensor, a media center, a real-time clock, and even a security monitoring device, all of which require minimal programming experience. Along with these projects, you'll learn all about the Raspberrry Pi hardware, including how it can be so powerful and still so small and inexpensive, why it's so suitable as a video player, and how you can customize it for different tasks, including running different operating systems on it, including Android and RISC OS. The Raspberrry Pi is an inexpensive but relatively powerful little computer. It was designed to get kids interested in computing and programming, but it's also a great platform for hardware hackery. The projects in this book will get you deep into the hardware to show you what the Raspberrry Pi can really do.

Internet of Things with 8051 and ESP8266 provides a platform to get started with the Internet of Things (IoT) with 8051. This book describes programming basics and how devices interface within designed systems. It presents a unique combination of 8051 with ESP8266 and I/O devices for IoT applications supported by case studies to provide the solutions to real-time problems. The programs and circuits have been tested on real hardware and explore different areas in IoT applications. Divided into four sections, it explains the customized boards for IoT applications followed by the means by which 8051 and ESP8266 interface with I/O devices. It spans levels from basic to advanced interfacing with special devices, server design, and data logging with different platforms. Features: Covers how I/O devices interface with 8051 and ESP8266 Explains the basic concepts of interfacing complexity using applications with examples Provides hands-on practice exercises with 8051 and ESP8266 for IoT applications Discusses both case studies and programming tests on real hardware during industrial and student projects Reviews the integration of smart devices with IoT Internet of Things with 8051 and ESP8266 is intended for senior undergraduate and graduate students in electrical and electronics engineering, but anyone with an interest in the professional curriculum of electrical and electronics engineering will find this book a welcome addition to their collection.

The eight-volume set LNCS 13375 – 13382 constitutes the proceedings of the 22nd International Conference on Computational Science and Its Applications, ICCSA 2022, which was held in Malaga, Spain during July 4 – 7, 2022. The first two volumes contain the proceedings from ICCSA 2022, which are the 57 full and 24 short papers presented in these books were carefully reviewed and selected from 279 submissions. The other six volumes present the workshop proceedings, containing 285 papers out of 815 submissions. These six volumes includes the proceedings of the following workshops: ? Advances in Artificial Intelligence Learning Technologies: Blended Learning, STEM, Computational Thinking and Coding (AAILT 2022); Workshop on Advancements in Applied Machine-learning and Data Analytics (AAMDA 2022); Advances in Information Systems and Technologies for Emergency management, risk assessment and mitigation based on the Resilience (ASTER 2022); Advances in Web Based Learning (AWBL 2022); Blockchain and Distributed Ledgers: Technologies and Applications (BDLTA 2022); Bio and Neuro inspired Computing and Applications (BIONCA 2022); Configurational Analysis For Cities (CA Cities 2022); Computational and Applied Mathematics (CAM 2022), Computational and Applied Statistics (CAS 2022); Computational Mathematics, Statistics and Information Management (CMSIM); Computational Optimization and Applications (COA 2022); Computational Astrochemistry (CompAstro 2022); Computational methods for porous geomaterials (CompPor 2022); Computational Approaches for Smart, Conscious Cities (CASCC 2022); Cities, Technologies and Planning (CTP 2022); Digital Sustainability and Circular Economy (DiSCE 2022); Econometrics and Multidimensional Evaluation in Urban Environment (EMEUE 2022); Ethical AI applications for a human-centered cyber society (EthicAI 2022); Future Computing System Technologies and Applications (FISTA 2022); Geographical Computing and Remote Sensing for Archaeology (GCRSArcheo 2022); Geodesign in Decision Making: meta planning and collaborative design for sustainable and inclusive development (GDM 2022); Geomatics in Agriculture and Forestry: new advances and perspectives (GeoForAgr 2022); Geographical Analysis, Urban Modeling, Spatial Statistics (Geog-An-Mod 2022); Geomatics for Resource Monitoring and Management (GRMM 2022); International Workshop on Information and Knowledge in the Internet of Things (IKIT 2022); 13th International Symposium on Software Quality (ISSQ 2022); Land Use monitoring for Sustainability (LUMS 2022); Machine Learning for Space and Earth Observation Data (MALSEOD 2022); Building multi-dimensional models for assessing complex environmental systems (MES 2022); MOdels and indicators for assessing and measuring the urban settlement deVelopment in the view of ZERO net land take by 2050 (MOVEto0 2022); Modelling Post-Covid cities (MPCC 2022); Ecosystem Services: nature's contribution to people in practice. Assessment frameworks, models, mapping, and implications (NC2P 2022); New Mobility Choices For Sustainable and Alternative Scenarios (NEMOB 2022); 2nd Workshop on Privacy in the Cloud/Edge/IoT World (PCEIoT 2022); Psycho-Social Analysis of Sustainable Mobility in The Pre- and Post-Pandemic Phase (PSYCHE 2022); Processes, methods and tools towards RESilient cities and cultural heritage prone to SOD and ROD disasters (RES 2022); Scientific Computing Infrastructure (SCI 2022); Socio-Economic and

Environmental Models for Land Use Management (SEMLUM 2022); 14th International Symposium on Software Engineering Processes and Applications (SEPA 2022); Ports of the future - smartness and sustainability (SmartPorts 2022); Smart Tourism (SmartTourism 2022); Sustainability Performance Assessment: models, approaches and applications toward interdisciplinary and integrated solutions (SPA 2022); Specifics of smart cities development in Europe (SPEED 2022); Smart and Sustainable Island Communities (SSIC 2022); Theoretical and Computational Chemistry and its Applications (TCCMA 2022); Transport Infrastructures for Smart Cities (TISC 2022); 14th International Workshop on Tools and Techniques in Software Development Process (TTSDP 2022); International Workshop on Urban Form Studies (UForm 2022); Urban Regeneration: Innovative Tools and Evaluation Model (URITEM 2022); International Workshop on Urban Space and Mobilities (USAM 2022); Virtual and Augmented Reality and Applications (VRA 2022); Advanced and Computational Methods for Earth Science Applications (WACM4ES 2022); Advanced Mathematics and Computing Methods in Complex Computational Systems (WAMCM 2022).

This two-volume set (CCIS 1393 and CCIS 1394) constitutes selected and revised papers of the 4th International Conference on Advanced Informatics for Computing Research, ICAICR 2020, held in Gurugram, India, in December 2020. The 34 revised full papers and 51 short papers presented were carefully reviewed and selected from 306 submissions. The papers are organized in topical sections on computing methodologies; hardware; networks; security and privacy.

Proceedings of the International Conference on Recent Trends in Communication and Electronics (ICCE-2020), Ghaziabad, India, 28-29 November, 2020

Beginning Arduino

Architecture, Assembly Language, and Hardware Interfacing

Raspberry Pi I/O Programming Using Python

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