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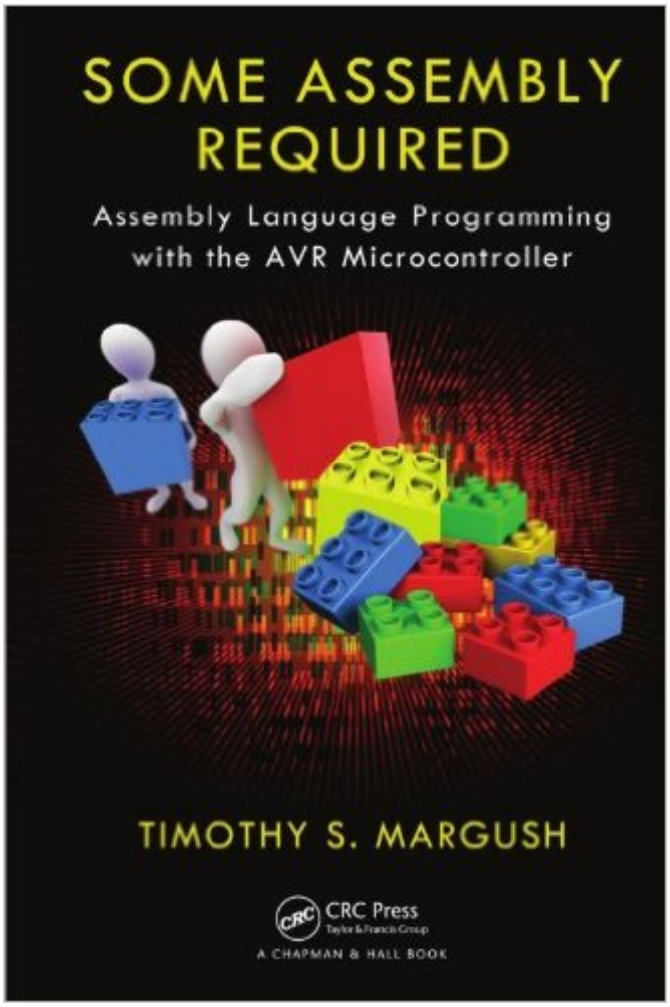
Some Assembly Required: Assembly Language Programming With The AVR Microcontroller



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Synopsis

A family of internationally popular microcontrollers, the Atmel AVR microcontroller series is a low-cost hardware development platform suitable for an educational environment. Until now, no text focused on the assembly language programming of these microcontrollers. Through detailed coverage of assembly language programming principles and techniques, Some Assembly Required: Assembly Language Programming with the AVR Microcontroller teaches the basic system capabilities of 8-bit AVR microcontrollers.The text illustrates fundamental computer architecture and programming structures using AVR assembly language. It employs the core AVR 8-bit RISC microcontroller architecture and a limited collection of external devices, such as push buttons, LEDs, and serial communications, to describe control structures, memory use and allocation, stacks, and I/O. Each chapter contains numerous examples and exercises, including programming problems.By studying assembly languages, computer scientists gain an understanding of the functionality of basic processors and how their capabilities support high level languages and applications. Exploring this connection between hardware and software, this book provides a foundation for understanding compilers, linkers, loaders, and operating systems in addition to the processors themselves.

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Customer Reviews

This book is an excellent source of very useful details on assembly language programming of the AVR family of microcontrollers. It is also a very good "how to" book on how to use ATMELs starter kit boards and xplained boards for the AVR. For those without a formal education and training in assembly programming of microcontrollers, this is a must read. I am 90 pages into it and it has already cleared up a dozen misconceptions and problems that I was having programming the chips and using the starter kit boards. It really lets you get the most out of these devices.It goes far beyond the help files that one finds in ATMEL’s Visual Studio 5 software and offers very practical instructions and information. It’s the best book purchase that I have ever made on .com and is well worth the price.

So far this book is treating me well. I already had a great deal of information on Atmel AVR assembler printed out from Atmel website and organized into a giant ring binder, but this book some how manages to incorporate all that information into a smaller and nicely presented format.I use an ATMEGA2560 board (from an Arduino reference) and an Atmel AVR XMEGA-A1 XPlained boards for my projects. I use Atmel AVRISP mkII programmer to load code into the chips via Atmel Studio 6 (free development environment from Atmel). That is pretty much all you will need to get started. If you love doing manual soldering and tinkering then you will be okay with a 2560 board, because you will need to make your own LED output boards, switch boards, etc. The XMEGA-A1 board has majority of that stuff already built-in.

I LOVE this book. I’ve read through the entire XMEGA AU Manual, and had just started diving into assembly. This book explained in detail all the things I have been confused about, and has been invaluable in clearing up many things I was confused about. I’m about a third of the way through it, and it really is leaving no stone un-turned. That being said, I think this is a book targeted towards those who have some experience programming and dealing with digital devices, and who aren’t afraid of diving in and getting their hands dirty. It complements the AVR device manuals and datasheets very well, going over the details Atmel assumes their readers already know.

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