

Cryptocurrency

ALL-IN-ONE







Kiana Danial et al.



Cryptocurrency

ALL-IN-ONE

by Kiana Danial, Tiana Laurence, Peter Kent, Tyler Bain, Michael G. Solomon



Cryptocurrency All-in-One For Dummies®

Published by: John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030-5774, www.wiley.com

Copyright © 2022 by John Wiley & Sons, Inc., Hoboken, New Jersey

Published simultaneously in Canada

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without the prior written permission of the Publisher. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, (201) 748-6011, fax (201) 748-6008, or online at http://www.wiley.com/go/permissions.

Trademarks: Wiley, For Dummies, the Dummies Man logo, Dummies.com, Making Everything Easier, and related trade dress are trademarks or registered trademarks of John Wiley & Sons, Inc. and may not be used without written permission. All other trademarks are the property of their respective owners. John Wiley & Sons, Inc. is not associated with any product or vendor mentioned in this book.

LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY: WHILE THE PUBLISHER AND AUTHORS HAVE USED THEIR BEST EFFORTS IN PREPARING THIS WORK, THEY MAKE NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS WORK AND SPECIFICALLY DISCLAIM ALL WARRANTIES, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTY MAY BE CREATED OR EXTENDED BY SALES REPRESENTATIVES, WRITTEN SALES MATERIALS OR PROMOTIONAL STATEMENTS FOR THIS WORK. THE FACT THAT AN ORGANIZATION, WEBSITE, OR PRODUCT IS REFERRED TO IN THIS WORK AS A CITATION AND/ OR POTENTIAL SOURCE OF FURTHER INFORMATION DOES NOT MEAN THAT THE PUBLISHER AND AUTHORS ENDORSE THE INFORMATION OR SERVICES THE ORGANIZATION, WEBSITE, OR PRODUCT MAY PROVIDE OR RECOMMENDATIONS IT MAY MAKE. THIS WORK IS SOLD WITH THE UNDERSTANDING THAT THE PUBLISHER IS NOT ENGAGED IN RENDERING PROFESSIONAL SERVICES. THE ADVICE AND STRATEGIES CONTAINED HEREIN MAY NOT BE SUITABLE FOR YOUR SITUATION. YOU SHOULD CONSULT WITH A SPECIALIST WHERE APPROPRIATE. FURTHER, READERS SHOULD BE AWARE THAT WEBSITES LISTED IN THIS WORK MAY HAVE CHANGED OR DISAPPEARED BETWEEN WHEN THIS WORK WAS WRITTEN AND WHEN IT IS READ. NEITHER THE PUBLISHER NOR AUTHORS SHALL BE LIABLE FOR ANY LOSS OF PROFIT OR ANY OTHER COMMERCIAL DAMAGES, INCLUDING BUT NOT LIMITED TO SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR OTHER DAMAGES.

For general information on our other products and services, please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002. For technical support, please visit https://hub.wiley.com/community/support/dummies.

Wiley publishes in a variety of print and electronic formats and by print-on-demand. Some material included with standard print versions of this book may not be included in e-books or in print-on-demand. If this book refers to media such as a CD or DVD that is not included in the version you purchased, you may download this material at http://booksupport.wiley.com. For more information about Wiley products, visit www.wiley.com.

Library of Congress Control Number: 2021950430

ISBN 978-1-119-85580-4 (pbk); ISBN 978-1-119-85581-1 (ebk); ISBN 978-1-119-85582-8 (ebk)

Contents at a Glance

Introd	uction	1
CHAPTER 1: CHAPTER 2: CHAPTER 3:		7 15
Book 2	: Blockchain Basics	59
	Introducing Blockchain	
CHAPTER 2:	Picking a Blockchain	
CHAPTER 3:		
CHAPTER 4:	Beholding the Bitcoin Blockchain	91
CHAPTER 5:	Encountering the Ethereum Blockchain	
CHAPTER 6:	Getting Your Hands on Hyperledger	. 115
CHAPTER 7:	Financial Technology	. 123
Book 3	: Bitcoin	. 133
CHAPTER 1:	Bitcoin Tech Explained	. 135
	Buying, Using, and Selling Bitcoin	
CHAPTER 3:	Taking Control of Your Wallet (and Hodling Your Bitcoin)	. 191
CHAPTER 4:	Keeping Your Bitcoin Safe	. 227
Book 4	: Ethereum	. 249
CHAPTER 1:	Getting to Know Ethereum	. 251
CHAPTER 2:	Exploring Use Cases for Ethereum	. 259
CHAPTER 3:	Examining the Ethereum Ecosystem and Development Life cycle $\!\!$. 273
CHAPTER 4:	Getting and Configuring Ethereum Development Tools	. 289
CHAPTER 5:	0	
CHAPTER 6:	Discovering Smart Contracts	. 325
CHAPTER 7:	Writing Your Own Smart Contracts with Solidity	
CHAPTER 8:	Testing Ethereum Apps	
CHAPTER 9:	Deploying Ethereum Apps	. 391
Book 5	: Cryptocurrency Investing	. 405
CHAPTER 1:	Why Invest in Cryptocurrencies?	. 407
CHAPTER 2:	Recognizing the Risks of Cryptocurrencies	. 423

CHAPTER 3:	Cryptocurrency Exchanges and Brokers439
CHAPTER 4:	Identifying Top-Performing Cryptocurrencies455
CHAPTER 5:	Diversification in Cryptocurrencies
CHAPTER 6:	Getting Ahead of the Crowd: Investing in ICOs479
CHAPTER 7:	Stocks and Exchange-Traded Funds with
	Cryptocurrency Exposure
CHAPTER 8:	Cryptocurrency Futures and Options
CHAPTER 9:	Dealing with the Dollar and Other Fiat Currencies 507
CHAPTER 10:	Using Technical Analysis
CHAPTER 11:	Short-Term Trading Strategies529
CHAPTER 12:	Long-Term Investing Strategies
CHAPTER 13:	Minimizing Losses and Maximizing Gains
CHAPTER 14:	Using Ichimoku and Fibonacci Techniques
CHAPTER 15:	Taxes and Cryptocurrencies
Book 6	: Cryptocurrency Mining577
	Understanding Cryptocurrency Mining579
CHAPTER 2:	Exploring the Different Forms of Mining
CHAPTER 3:	Mining Made Simple: Finding a Pool and Preparing an Account 609
CHAPTER 4:	Picking a Cryptocurrency to Mine
CHAPTER 5:	Gathering Your Mining Gear659
CHAPTER 6:	Setting Up Your Mining Hardware681
CHAPTER 7:	Running the Numbers: Is It Worth It?707
CHAPTER 8:	Reducing Negatives and Gaining an Edge733
	Running Your Cryptocurrency Business
Index	775

Table of Contents

INTRO	DUCTION	1
	About This Book	1
	Foolish Assumptions	2
	Icons Used in This Book	2
	Beyond the Book	3
	Where to Go From Here	3
воок	1: CRYPTOCURRENCY BASICS	5
CHAPTER 1:	What Is a Cryptocurrency?	7
	Beginning with the Basics of Cryptocurrencies	8
	The definition of money	
	Some cryptocurrency history	
	Key crypto benefits	9
	Common crypto and blockchain myths	
	Risks	.11
	Gearing Up to Make Transactions	.12
	Wallets	
	Exchanges	.12
	Communities	
	Making a Plan Before You Jump In	.14
CHAPTER 2:	How Cryptocurrencies Work	. 15
	Explaining Basic Terms in the Cryptocurrency Process	.15
	Cryptography	
	Nodes	
	Mining	
	Proof of work	
	Proof of stake	
	Proof of importance	
	Transactions: Putting it all together	
	Cruising through Other Important Crypto Concepts	
	Adaptive scaling	
	Decentralization	
	Harvesting	
	Open source	
	Public ledger	
	Smart contracts	.22

	Stick a Fork in It: Digging into Cryptocurrency Forks	
	What is a fork, and why do forks happen?	
	Hard forks and soft forks	
	Free money on forks	.25
CHAPTER 3:	Introducing Cryptocurrency Wallets	27
CHAPTER 3:		
	Defining Cryptocurrency Wallets	
	A few important terms	
	How a wallet works	
	Looking at Different Types of Wallets	
	Online wallet	
	Mobile wallet	
	Desktop wallet	
	Hardware wallet	
	Paper wallet	
	Choosing a Crypto Wallet	
	Based on security	
	Based on your crypto ownership	
	Based on transaction fees	
	Based on anonymity	
	Keeping Your Wallet Secure	
	Have multiple wallets	
	Update your software	
	Remember where you nide it:	.41
CHAPTER 4:	Different Types of Cryptocurrencies	. 43
	Celebrating Celebrity Cryptocurrencies by Market Cap	
	Bitcoin	
	Ethereum	.46
	Ripple	.48
	Cardano	.50
	Other top ten major cryptos	.52
	Top 100 major cryptos	
	Cryptocurrencies by Category	.53
	Payment cryptos	.54
	Privacy cryptos	
	Platform cryptos	
	Exchange-specific cryptos	
	Finance/fintech cryptos	
	Legal and property cryptos	

ВООК	2: BLOCKCHAIN BASICS	59
CHAPTER 1:	Introducing Blockchain Beginning at the Beginning: What Blockchains Are What blockchains do. Why blockchains matter The Structure of Blockchains. Blockchain Applications The Blockchain Life Cycle Consensus: The Driving Force of Blockchains. Blockchains in Use. Current blockchain uses Future blockchain applications	61 62 64 66 66 68 69
CHAPTER 2:	Picking a Blockchain Where Blockchains Add Substance. Determining your needs. Defining your goal. Choosing a Solution Drawing a blockchain decision tree Making a plan.	
CHAPTER 3:	Getting Your Hands on Blockchain Diving into Blockchain Technology Creating a secure environment. Buying your first Bitcoin Building a Private Blockchain with Docker and Ethereum Preparing your computer. Building your blockchain	
CHAPTER 4:	Beholding the Bitcoin Blockchain Getting a Brief History of the Bitcoin Blockchain The New Bitcoin: Bitcoin Cash Debunking Some Common Bitcoin Misconceptions Bitcoin: The New Wild West Fake sites No, you first! Get-rich-quick schemes Mining for Bitcoins Making Your First Paper Wallet	

Exploring the Brief History of Ethereum
Decentralized applications: Welcome to the future
The power of decentralized autonomous organizations
Hacking a Blockchain108
Understanding smart contracts108
Discovering the cryptocurrency Ether109
Getting Up and Running on Ethereum109
Mining for Ether110
Building your first decentralized autonomous organization
Uncovering the Future of DAOs
Putting money in a DAO
Finding bugs in the system113
Creating Your Own ERC-20 Token114
creating roar own the 20 token
CHAPTER 6: Getting Your Hands on Hyperledger115
Getting to Know Hyperledger
Identifying Key Hyperledger Projects
Focusing on Fabric117
Investigating the Iroha project117
Diving into Sawtooth119
Building Your System in Fabric
Building Asset Tracking with Hyperledger Composer
Working with Smart Contracts on Hyperledger
CHAPTER 7: Financial Technology123
Hauling Out Your Crystal Ball: Future Banking Trends123
Moving money faster: Across borders and more125
Creating permanent history126
Going International: Global Financial Products127
Border-free payroll
Faster and better trade129
Guaranteed payments
Micropayments: The new nature of transactions
Squeezing Out Fraud131
BOOK 3: BITCOIN
CHAPTER 1: Bitcoin Tech Explained
Understanding That There Is No Bitcoin!
Discovering the Bitcoin Ledger
So where is this "Bitcoin ledger"?
Bitcoin uses a blockchain ledger

	Looking at the Bitcoin Distributed, Peer-to-Peer Network	138
	Using the Bitcoin Blockchain's Blocks of Business	
	Hashing the blocks	
	The Bitcoin blockchain is "immutable"	142
	Finding Out How the Ledger Functions	144
	Your address: where your money is stored in the ledger	
	What's the crypto in cryptocurrency?	145
	Public key encryption magic	
	Messages to the blockchain	149
	Signing messages with the private key	149
	Sending a transaction message to the Bitcoin ledger	
	Unraveling the message	
	But you'll need a wallet	152
CHAPTER 2:	Buying, Using, and Selling Bitcoin	155
	Finding the Price of Bitcoin	
	Your Options for Acquiring Bitcoin	
	Bitcoin ATMs	
	Retail Bitcoin.	
	Person-to-person trading	
	Bitcoin exchanges	
	"Bitcoin Back" on Credit and Debit Cards	
	Earning Your Bitcoin	
	Mining Bitcoin	
	Finding Bitcoin Everywhere	
	Selling Your Bitcoin	
	Taking Control of Your Wallet	
CHAPTER 3:		101
	(and Hodling Your Bitcoin)	
	What Is a Wallet?	
	Wallets store private keys	
	Wallets create and store keys and addresses	
	Wallets communicate with the Bitcoin network	
	Wallets can be hot or cold	
	Exploring Wallet Hardware	
	Brain wallets	
	Paper wallets	
	Metal wallets	
	Hardware wallets	
	Web wallets	
	Dedicated full nodes	
	Software wallets	
	Finding a Wallet	
	Setting Up a Bitcoin Wallet	201

	Creating and securing your first wallet	
	Creating a 24-word seed	
	Increasing security with a fake account	
	Receiving Bitcoin	
	Getting those notifications	
	Checking your addresses	210
	Sending Bitcoin	
	Following the money	
	Backing up your wallet	214
	Importing (or recovering) a wallet	
	Creating a watch-only wallet	
	Exploring multiple-signature wallets	
	Using the Lightning Network	225
CHAPTER 4:	Keeping Your Bitcoin Safe	227
	Understanding How You Can Lose Control of Your Bitcoin	
	Grasping the Goal: Private Key and Seed Protection	
	Making a Choice: Custodial or Private Wallet?	
	Devising Your Cryptocurrency Safety Plan	
	Producing powerful passwords	
	Protecting passwords with password programs	
	Protecting your computer	
	Watching out for sophisticated phishing	
	Employing two-factor authentication	
	Exploring More Ways to Protect Your Bitcoin (and	
	Everything Else)	243
	Knowing What Happens When You Kick the Bucket	
	Choosing the multi-sig solution	
	Scheduling future transactions	
	Using a digital inheritance feature	247
DOO!		
BOOK	4: ETHEREUM	249
CHAPTER 1:	Getting to Know Ethereum	251
	Exploring Ethereum's Consensus, Mining, and Smart Contracts.	252
	Buying, Spending, and Trading Ether	
	Getting Started with DAO and ICO	
	Delving into Development Tools	
CHARTER 2:	Exploring Use Cases for Ethereum	250
CHAFTER Z	Diving into Ethereum Applications	
	- 11	
	Exploring Financial Services	
	Creating Ethereum escrow applications	
	• • • • • • • • • • • • • • • • • • • •	
	Examining ICOs	∠04

	Establishing Digital Identity Management	265
	Managing individual and device identities	266
	Reducing fraud and identity theft	
	Examining the ERC-725 standard and beyond	
	Examining Industry Applications	
	Healthcare	
	Energy	
	Supply chain	
	Enabling Effective Governance	
	Tax payment	
	Government spending	
	Voting Policy development	
	Notary	
	Notary	2/2
CHAPTER 3:	Examining the Ethereum Ecosystem	
	and Development Life cycle	273
	Exploring the Ethereum Blockchain Block Structure	
	Describing Smart Contracts	
	Introducing Solidity, the Language of Smart Contracts	
	Working with the Ethereum Virtual Machine	
	Fueling Your Code with Gas	282
	Surveying Tools for Developing, Testing, and Deploying	
	Ethereum Apps	
	Ethereum blockchain client	
	Development and testing blockchain	
	Compiler and testing framework	
	Source code editor/IDE Describing the Ethereum Development Life cycle	
	Introducing Smart Contract Development Tools	
	introducing simart contract Development roots	200
CHAPTER 4:	Getting and Configuring Ethereum	
	Development Tools	289
	Examining Why Multiple Ethereum Development Tools Are	
	Available	290
	Downloading, Installing, and Configuring All the Pieces	291
	Installing the blockchain client	291
	Installing the test blockchain	295
	Installing the testing environment	299
	Installing the IDE	304
	Puilding Vour Eirst Ethoroum Anns	200
CHAPTER 5:	Building Your First Ethereum Apps	
	Validating Your Ethereum Development Environment	
	Creating a Truffle project	
	Editing the Truffle config file	311

	Exploring the Ganache Test Environment	
	Designing Simple Smart Contracts	315
	Coding Your First Smart Contract	316
	Running Your First Smart Contract	318
	Writing your code	318
	Compiling your code	319
	Deploying your code	320
	Invoking your code's functions	322
	Paying as You Go	323
CHAPTER 6:	Discovering Smart Contracts	325
	Introducing Supply Chain and Common Challenges	
	Describing supply chain	
	Identifying difficulties when implementing a supply chain.	
	Examining How Blockchain Can Help Resolve Supply Chain	
	Problems.	
	Implementing a Blockchain Supply Chain Solution	
	Paying for supply chain services	
	Managing assets on the supply chain	
	Digging into Solidity	
	Describing Basic Smart Contract Syntax	
	Declaring a valid compiler version	
	Commenting your code	
	Importing external code	
	Defining your smart contracts	
	Handling Data in Solidity	
	Finding Out about Computation and Gas Exploring Access Modes and Visibility of Smart Contract	340
	Functions and Data	342
	Controlling Execution Flow	
	Handling Errors and Exceptions	
	·	
CHAPTER 7:	Writing Your Own Smart Contracts	
	with Solidity	
	Reviewing Supply Chain Design Specification	
	Payment token smart contract	
	Supply chain smart contract	
	Creating New Smart Contracts	
	ERC-20 token interface	
	ERC-20 token smart contract	354
	Supply chain smart contract	355
	Coding Primary Functions	
	ERC-20 token functions	
	Supply chain functions	360

	Using Events	363
	Defining events	
	Triggering events	
	Introducing Ownership	
	Designing for Security	
	Implementing Minimal Functionality	371
CHAPTER 8:	Testing Ethereum Apps	. 373
	Understanding Ethereum dApp Testing	
	Writing tests from the beginning	
	Choosing the right test blockchain	
	Walking through the steps in the testing life cycle	375
	Testing for software quality	375
	Deploying a dApp to a Test Ethereum Blockchain	376
	Telling Truffle to use the Ganache blockchain	
	Deploying your code to the Ganache blockchain	
	Writing Tests for Ethereum dApps	
	Testing using the command line	
	Writing test cases in JavaScript	
	Logging and Handling Errors	
	Handling errors in Solidity	
	Logging activity in smart contracts	
	Fixing Bugs in a dApp	
CHAPTER 9:	Deploying Ethereum Apps	. 391
	Test Blockchain Options versus Live Blockchains	392
	Testing with the Ganache blockchain	392
	Deploying your code to other test blockchains	
	Anticipating Differences in Live Environments	395
	Preparing Your Configuration for Deploying to	
	Different Networks	
	Deploying a dApp	
	Getting enough Ether	
	Compiling your code Deploying your code	
	Deploying your code	405
ВООК	5: CRYPTOCURRENCY INVESTING	. 405
CHAPTER 1:	Why Invest in Cryptocurrencies?	. 407
	Diversifying from Traditional Investments	
	Stocks	
	Bonds	
	Forex	
	Precious metals	413

	Gaining Capital Appreciation	
	Huge growth potential	
	Increasing Income Potential	
	A bit about traditional dividends	
	The basics on crypto dividends	
	Fueling Ideological Empowerment	
	The economy of the future	
	Freedom from government control of currency	
	Help for the unbanked and underbanked	
CHAPTER 2:	Recognizing the Risks of Cryptocurrencies	423
	Reviewing Cryptocurrency Returns	
	Capital gains (or losses)	
	Income	
	Risk: Flipping the Other Side of the Coin	
	Glimpsing Cryptocurrencies' Reward versus Risk	426
	Digging into Different Kinds of Risk	
	Crypto hype risk	427
	Security risk	428
	Volatility risk	430
	Liquidity risk	430
	Vanishing risk	431
	Regulation risk	432
	Tax risk	432
	Exploring Risk Management Methods	
	Build your emergency fund first	
	Be patient	
	Diversify outside and inside your cryptocurrency portfolio	437
CHAPTER 3:	Cryptocurrency Exchanges and Brokers	
	Distinguishing Crypto Exchanges	
	Centralized exchanges	
	Decentralized exchanges	
	Hybrid exchanges	
	How to choose an exchange	
	Considering Brokers	
	How brokers work	
	The pros and cons of using a broker	
	How to choose a broker	
	Looking at Other Methods for Buying Cryptos	
	Funds	
	Credit card	453
	UavUal	150

	Cash Cryptocurrency ATMs	
CHAPTER 4.	Identifying Top-Performing Cryptocurrencies	455
CIPAL IER 4.	Introducing the Invest Diva Diamond Analysis	
	Using Fundamental Analysis to Pick Cryptocurrencies	
	Go with what you know	
	Choose the right categories	
	Check out cryptos' websites	
	Choosing Cryptos with Sentimental Analysis	461
	Key sentimental elements	
	Stuff to check in the news	
	Trying Technical Analysis to Select Cryptos	466
CHAPTER 5:	Diversification in Cryptocurrencies	467
	Breaking Down Some Basics on Diversification	467
	What is traditional diversification?	
	How does diversification reduce risk?	
	Using Cryptocurrencies in Long-Term Diversification	
	Diversifying with non-cryptocurrencies	
	Diversifying among cryptocurrencies	
	Tackling Diversification in Short-Term Trades	4//
CHAPTER 6:	Getting Ahead of the Crowd: Investing in ICOs.	
CHAPTER 6:	Understanding the Basics of Initial Coin Offerings	479
CHAPTER 6:	Understanding the Basics of Initial Coin Offerings	479 480
CHAPTER 6:	Understanding the Basics of Initial Coin Offerings How an ICO works and how to start one	479 480 481
CHAPTER 6:	Understanding the Basics of Initial Coin Offerings How an ICO works and how to start one ICOs versus IPOs	479 480 481 483
CHAPTER 6:	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO Finding ICO listings.	479 480 481 483
CHAPTER 6:	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO Finding ICO listings. Analyzing an ICO listing.	479 480 481 483 483
CHAPTER 6:	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO. Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process.	479 480 481 483 484 484
CHAPTER 6:	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO. Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process. Holding your tokens after your purchase.	479 480 481 483 484 486 486
CHAPTER 6:	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO. Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process.	479 480 483 483 484 486 486
CHAPTER 6:	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO. Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process. Holding your tokens after your purchase. So You Want to Start an ICO: Launching an ICO Yourself	479 480 483 483 484 486 486 487 487
	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO. Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process. Holding your tokens after your purchase. So You Want to Start an ICO: Launching an ICO Yourself. Understanding the challenges. Taking a few steps before the launch.	479 480 483 483 484 486 486 487 487
	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO. Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process. Holding your tokens after your purchase. So You Want to Start an ICO: Launching an ICO Yourself. Understanding the challenges. Taking a few steps before the launch. Stocks and Exchange-Traded Funds with	479 480 481 483 484 486 486 487 487
	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO. Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process. Holding your tokens after your purchase. So You Want to Start an ICO: Launching an ICO Yourself. Understanding the challenges. Taking a few steps before the launch. Stocks and Exchange-Traded Funds with Cryptocurrency Exposure.	479 480 481 483 484 486 486 487 488
	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO. Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process. Holding your tokens after your purchase. So You Want to Start an ICO: Launching an ICO Yourself. Understanding the challenges. Taking a few steps before the launch. Stocks and Exchange-Traded Funds with Cryptocurrency Exposure Looking for Stocks with Exposure to Cryptos. Fundamentals	479 480 481 483 484 486 486 487 487 488
	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO. Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process. Holding your tokens after your purchase. So You Want to Start an ICO: Launching an ICO Yourself. Understanding the challenges. Taking a few steps before the launch. Stocks and Exchange-Traded Funds with Cryptocurrency Exposure Looking for Stocks with Exposure to Cryptos.	479 480 481 483 484 486 486 487 487 488
	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO. Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process. Holding your tokens after your purchase. So You Want to Start an ICO: Launching an ICO Yourself. Understanding the challenges. Taking a few steps before the launch. Stocks and Exchange-Traded Funds with Cryptocurrency Exposure Looking for Stocks with Exposure to Cryptos. Fundamentals. Market sentiment factors. Other considerations	479480481483484486487488489491492494495
	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process. Holding your tokens after your purchase. So You Want to Start an ICO: Launching an ICO Yourself. Understanding the challenges. Taking a few steps before the launch. Stocks and Exchange-Traded Funds with Cryptocurrency Exposure Looking for Stocks with Exposure to Cryptos Fundamentals Market sentiment factors. Other considerations Considering Cryptocurrency and Blockchain ETFs.	479480481483484486487488489491492492494495496
	Understanding the Basics of Initial Coin Offerings. How an ICO works and how to start one. ICOs versus IPOs. Investing in an ICO. Finding ICO listings. Analyzing an ICO listing. Outlining the ICO investment process. Holding your tokens after your purchase. So You Want to Start an ICO: Launching an ICO Yourself. Understanding the challenges. Taking a few steps before the launch. Stocks and Exchange-Traded Funds with Cryptocurrency Exposure Looking for Stocks with Exposure to Cryptos. Fundamentals. Market sentiment factors. Other considerations	479480481483484486487488489491492494495496

CHAPTER 8:	Cryptocurrency Futures and Options	499
	Focusing on the Fundamentals of Futures	500
	Futures' features	500
	Financial futures	
	Introducing the Basics of Options	
	Futures versus options	
	Puts and calls	503
	Risks	
	Understanding Cryptocurrency Derivatives Trading	
	The advantages of crypto derivatives trading	
	The advantages of crypto derivatives for the industry	
	Trading resources	505
CHAPTER 9:	Dealing with the Dollar and Other Fiat	
	Currencies	
	Considering the World's Reserve Currency: The U.S. Dollar	
	Focusing on factors that affect the U.S. dollar	508
	Looking at Bitcoin versus the U.S. dollar	
	Examining the Euro and Other Major Currencies	
	The euro and the British pound	
	Safe havens: The Swiss franc and the Japanese yen	
	The Aussie, Kiwi, and Loonie dollars	
	Comparing the Forex Market and the Crypto Market	
	The similarities	
	The differences	
	•	
CHAPTER 10	Using Technical Analysis	517
	Beginning with the Basics of Technical Analysis	518
	The chart art	518
	The time factor	
	The psychology factor: Trends	
	Spotting the Key Levels	
	Support levels	
	Resistance levels	
	Trends and channels	
	When the trend is no longer your friend	
	Picking Out Patterns on a Chart	
	Bullish reversal patterns	
	Bearish reversal patterns	
	Smoothing Charts Out with Moving Averages	
	Basic moving averages	
	Sophisticated moving averages	528

CHAPTER 11: Short-Term Trading Strategies	529
Distinguishing Three Short-Term Time Frames Profiting within hours Profiting within days Profiting within weeks. Trying Short-Term Analysis Methods	530 533
Deciphering chart patterns	536 539 540
Managing Short-Term Trading Risk	540
CHAPTER 12: Long-Term Investing Strategies	543
Time Is on Your Side: Getting Started with Long-Term Investing.	
Your personal goals and current situation	
Your portfolio's objectives	
Creating Long-Term Strategies	
Observing psychological levels	
Keeping tax consequences in mind	
Considering Limit and Stop-Loss Orders	
Limit orders	
Stop-loss orders	549
CHAPTER 13: Minimizing Losses and Maximizing Gains	551
Keeping the Losses Down	
Measuring returns	
Monitoring exchange fees	
Understanding the art of getting out	
Letting the Profits Rise	
Buying at the bottom	
Knowing that patience is a profitable virtue	
Identifying the peaks	
Finding peaks and bottoms with a few trading tools	559
CHAPTER 14: Using Ichimoku and Fibonacci Techniques	
Getting a Handle on Ichimoku Kinko Hyo	
The components of Ichimoku Kinko Hyo	
Ichimoku interpretations	
Introducing Fibonacci Retracement Levels	
Some background on Fibonacci	
How to insert Fibonacci retracement levels into your chart	

CHAPTER 15	· Taxes and Cryptocurrencies	569
	Distinguishing Three Types of Crypto Taxes	569
	Income taxes	570
	Long-term capital gain taxes	570
	Short-term capital gain taxes	571
	Minimizing Your Crypto Taxes	572
	Lowering your mining income tax	572
	Reducing your trading tax	
	Bringing down your capital gain taxes	573
	Checking the rate of your state	
	Evaluating Taxable Income from Crypto Transactions	
	Tracking your crypto activity	
	Handling crypto forks	
	Reporting international crypto investments	575
BOOK	6: CRYPTOCURRENCY MINING	577
DOOK		
CHAPTER 1:	Understanding Cryptocurrency Mining	579
	Understanding Decentralized Currencies	580
	Exploring the Role of the Crypto Miner	581
	Making Cryptocurrency Trustworthy	582
	Reaching Agreement through Consensus Algorithms	584
	Looking at the Cryptocurrency Miner	585
	Making the Crypto World Go 'Round	587
CHAPTER 2:	Exploring the Different Forms of Mining	589
	Proof-of-Work Algorithms	
	Proof-of-work applications	
	Proof-of-work examples	
	Upsides	
	Downsides	
	Proof-of-Stake Algorithms	596
	Proof of stake explained	
	Proof-of-stake selections	598
	PoS example cryptocurrencies	599
	Upsides	600
	Downsides	600
	Hybrid Proof of Stake/Proof of Work	
	Hybrids explained	
	Hybridized examples	604
	Upsides	
	Downsides	
	Delegated Proof of Stake	
	Delegated Byzantine Fault Tolerance	605

	Proof of Burn	
CHAPTER 3:	Mining Made Simple: Finding a Pool	
	and Preparing an Account	. 609
	Understanding How Pool Mining Works	
	Choosing a Pool	
	Pools that are good starting points	
	A few of the largest pools	
	Incentives and rewards	
	Pool ideology	
	Pool reputation	
	Pool percentage of the total petwork	
	Pool percentage of the total network Setting Up a Pool Account	
	Server choice	
	Mining equipment pool settings	
	Payout addresses	
	Payout thresholds	
	Researching Mining Pools	
	Cloud Mining	
CHAPTER 4:	Picking a Cryptocurrency to Mine	. 629
	Determining Your Goal	
	Mineable? PoW? PoS?	
	Researching Cryptocurrencies	
	Mining profitability comparison sites	.633
	Algorithms and cryptocurrencies	.637
	The cryptocurrency's details page	
	Mining-profit calculators	
	The cryptocurrency's home page	
	GitHub	
	The cryptocurrency's Wikipedia page	
	Mining forums	
	Going Deep	
	Longevity of a cryptocurrency	
	Hash rate and cryptocurrency security	
	Community support Knowing That Decentralization Is a Good Thing	.052
	Finding Out It's an Iterative Process	
CHARTER F:	Gathering Your Mining Gear	650
CHAFTER 5:	Selecting the Correct Computational Mining Hardware	
	Specified hash rate	
	Specified power consumption	.662
	- - - - -	

	Equipment cost and other considerations	
	Length of time your hardware will be viable	
	Mining Equipment Manufacturers	
	ASIC rig producers	
	GPU rig producers	
	Finding a Wallet to Store and Protect Your Private Keys	
	Where to Mine? Selecting a Viable Location	
	Vet your home for cryptocurrency mining	
	Communication requirements	
	Power source thoughts	
	Data centers and other dedicated commercial locations	677
CHAPTER 6:	Setting Up Your Mining Hardware	681
	ASIC Mining Rigs	681
	Racks	682
	Power supply	683
	PDUs	684
	Network and Ethernet connection	686
	A computer to control your rig	686
	GPU Mining Rigs	
	Getting your GPU rig online	
	Building your own GPU miner	
	CPU Mining	700
	Mining Software	
	Pool mining	701
	Solo mining	705
CHAPTER 7:	Running the Numbers: Is It Worth It?	707
	Factors That Determine Mining Profitability	
	Cost of equipment	
	Hash rate of your equipment	
	Mining rig efficiency	
	Cost of electricity	
	Total network hash rate	
	Information about your pool	
	Block earnings	
	Cryptocurrency conversion rate	
	Calculating Your ROI	
	Your block earnings	
	Your expenses	
	Calculating ROI	
	Knowing the unknowns	
	Online profitability calculators	
	Historical estimates	720 730

CHAPTER 8:	Reducing Negatives and Gaining an Edge	733
	Profitability through Efficiency	734
	Upgrading aging equipment	734
	Mining different cryptocurrencies	
	Using exhaust heat	
	Reducing electricity bills	
	Knowledge Is Power	
	Why current events are important	
	The "fork wars"	
	Your forking decisions	
	Here Today, Gone Tomorrow	
	Evaluating Your Mining Resources	
	Increasing block difficulty	
	Diminishing returns due to halving events	
	Diffinition in greater is due to flatving events	
CHAPTER 9:	Running Your Cryptocurrency Business	753
	What to Do with Your Mined Cryptocurrency	754
	Convert your cryptocurrency	
	Buying equipment and paying bills	754
	Paying with crypto when you can't pay with crypto	
	Expand or upgrade your mining operation	
	But don't forget the tax	
	Hodling your cryptocurrency	
	Invest your cryptocurrency	
	Donate your cryptocurrency to charity	
	Gift your cryptocurrency	
	Determining When to Sell	
	Where to sell: Cryptocurrency exchanges	
	Dollar Cost Averaging	
	Dollar cost averaging your purchases	
	Cost averaging your exits	
	Custodial exchange risk	
	Tax and Your Mining Business	
	But you're mining, not investing	
	It gets complicated	
	Scaling Up?	
	Do not overextend	
	Milestones to meet before you reinvest	
	Planning your expansion	773
INDEX		775
4 1 3 1 1 1 1 1 1 1		//5

Introduction

he foundation of cryptocurrencies such as Bitcoin lies in a new technology called the *blockchain*; it's the infrastructure that cryptocurrencies are built on. Blockchain is a disruptive technology that many argue is bigger than the advent of the Internet. The applications of blockchain don't end with cryptocurrencies, though, just like the applications of the Internet don't end with email. If you want to find out what blockchains are, the basics of how to use them, which cryptocurrencies are lucrative investments, and what hardware is needed for cryptocurrency mining, this is the book for you.

About This Book

In this book, you find helpful advice for navigating the blockchain world and cryptocurrencies that run them — from the ins and outs of wallets, exchanges, Bitcoin, and Ethereum to investing in cryptocurrencies and even mining your own.

You don't have to read the book cover to cover. Just flip to the subject that you're interested in.

As you dip into and out of this book, feel free to skip the sidebars (shaded boxes) and the paragraphs marked with the Technical Stuff icon. They contain interesting but nonessential information.

Within this book, you may note that some web addresses break across two lines of text. If you're reading this book in print and want to visit one of these web pages, simply key in the web address exactly as it's noted in the text, pretending as though the line break doesn't exist. If you're reading this as an e-book, you've got it easy — just click the web address to be taken directly to the webpage.

Some of the web addresses are affiliate links, meaning that if you click them and start using a company's services through that specific web address, the author may earn an affiliate payment for making the introduction.

Foolish Assumptions

We didn't want to make too many assumptions about you and your experience with cryptocurrency, blockchains, mining, and legal matters, but we do assume the following:

- >> You have a computer, a smartphone, and access to the Internet.
- >> You know the basics of using your computer and the Internet, and how to download and install programs.
- >> You know how to navigate through menus within programs, how to find files on your computer, and how to create folders.
- >> You're new to blockchain and you aren't a skilled programmer. (Of course, if you are a skilled programmer, you can still get a lot out of this book you just may be able to breeze past some of the step-by-step guidelines.)
- You may have heard of, or even purchased, some cryptocurrencies (like Bitcoin or Ether, for example), but you don't really know how they work.
- Although you may have invested in other markets like the stock market before, you aren't necessarily familiar with the terminology and the technical aspects of trading and investing in cryptocurrencies.
- >> You are unfamiliar with cryptocurrency mining but are interested to know more and determine whether it's something you want to undertake.

Note: If you don't have high-speed access to the Internet, you may want to get it before diving into this book. You need high-speed access to be able to work with many of the valuable online tools that we recommend.

Icons Used in This Book

Throughout the margins of this book are icons drawing your attention to certain bits of information. Here's what those icons mean.



The Tip icon marks tips and shortcuts that you can use to make your life with cryptocurrency easier.

TIF



The Remember icon marks the information that's especially important to know — the stuff you'll want to commit to memory.



When you see this icon, you know the information is of a highly technical nature. You can skip over these icons without missing the main point of the topic at hand.



Watch out when you see this icon! It marks critical information that may save you headaches — or tokens.

Beyond the Book

In addition to the material in the print or e-book you're reading right now, this product also comes with some access-anywhere content on the web. Check out the free Cheat Sheet for more on the topics covered in the book. To get this Cheat Sheet, simply go to www.dummies.com and type Cryptocurrency All-in-One For Dummies Cheat Sheet in the Search box.

Where to Go From Here

The *Dummies* series tells you what you need to know and how to do the things you need to do to get the results you want. Readers don't have to read the entire book to learn about a topic. Like all good reference tools, this book is designed to be read when needed and it's divided into several parts.

If you're interested in investing, for example, you can head to Book 5 to learn about risk management, strategy development, and the whole industry in general. Book 1 provides an overview of the world of cryptocurrencies, and Book 2 is your gateway to the blockchain technology.

Book 3 takes a deep dive into Bitcoin, which is the oldest cryptocurrency and probably the most well-known. Book 4 lays the foundation of Ethereum and teaches you, in clear language, how to design and write your own software for the Ethereum blockchain environment.

If you want to delve into cryptocurrency mining, check out Book 6, which can help you decide if and how you're going to begin mining, including which is the right cryptocurrency for you to mine.

Cryptocurrency Basics

Contents at a Glance

CHAPTER 1:	What Is a Cryptocurrency?	7
CHAPTER 2:	How Cryptocurrencies Work	5
CHAPTER 3:	Introducing Cryptocurrency Wallets2	7
CHAPTER 4:	Different Types of Cryptocurrencies 4	3