



BLOCKCHAIN TRAINER MODEL-BLOCKCHAIN100

This trainer has been designed with a view to provide practical and experimental knowledge OF Blockchain Technology used for Cryptocurrencies like Bit coin.

SPECIFICATIONS



1. Blockchain Hardware

A. Main Node Micro Controller:

1. Quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz 2GB LP0DR4-3200 SDRAM
2. Gigabit Ethernet
3. H.265 (4kp60 decode), H264 (1080p60 decode, 1080p30 encode)
4. Micro-SD card slot & 32GB SD Card
5. M.2 SSD 128GB

B. Sub Node Micro Controller: 4 Nos

1. Quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz
2. 2GB LP0DR4-3200 SDRAM
3. Gigabit Ethernet
4. H.265 (4kp60 decode),
5. H264 (1080p60 decode, 1080p30 encode)
6. Micro-SD card slot & 32GB SD Card

C. Other Hardware

7. Display : 10.1 Inch, 1280 x 800, HDMI, 10 point IPS TouchScreen
8. Router : 1 Gbps WAN Port, 1 Gbps LAN Port, 128MB DRAM, 128MB NAND Flash RAM
9. USB : USB 3.0 - Nos
10. Expansion Port : Audio Headphone Output, Mic In,
GPIO Port : +5V, +3.3V, GND, GR0 27
Expansion Port: +5V, +3.3V, GND, SPI, ADC 8 Port, I2C PWM 16Port

2. Software:

1. Debian 8
2. Java
3. Eclipse Photon

3. Accessories:

1. Pen Drive with Software, Library, Driver,
Codes, Soft Copy of Manual and Mobile App : 16 GB
2. Printed Practical Manual : 1 No.
3. E-Books for Blockchain Subject : 10 Nos. in PDF Format
4. Mp4 Video Class for Blockchain : 40 Nos

4. Cabinet and PCB

The complete circuit diagram is screen printed on component side of the PCB with circuit and Parts at the same place. The PCB with components on front side is fitted in elegant wooden box having lock and key arrangement. The acrylic cover is fitted on PCB to safeguard parts. It works on 230 V AC Supply.

EXPERIMENTS

A. Blockchain Basics

1. What is Blockchain?
2. Background and history of Blockchain
3. Benefits and value of Blockchain
4. Use Cases, adoption, implementation and costs associated with Blockchain technology
5. Fundamentals of Blockchain technology applied to Cryptocurrency and Bitcoin
6. Digital ledger systems implemented in a distributed fashion
7. Role of central repository and central authority
8. Community of users and transactions in a ledger public
9. High-level technical overview of Blockchain technology
10. Application to electronic currency in depth
11. Hash chains and blocks
12. Permissioned blockchains and proof of work
13. Blockchain Limitations and Misconceptions
14. Blockchain Control
15. Malicious Users
16. Future of Blockchain

B. Blockchain Architecture

17. Principle of Hashing
18. What's a hash function?
19. Block hashing algorithm
20. Bitcoin vs. "other" Blockchains
21. Hash functions in Bitcoin
22. Bitcoin Hash Functions
23. Hashes with SHA-256
24. Bitcoin and SHA256
25. Simple hash functions in Python
26. Transactions
27. Asymmetric-Key Cryptography
28. Addresses and Address Derivation
29. Private Key Storage
30. Ledgers

31. Blocks
32. Chaining Blocks
33. Ethereum Blockchain
34. Blockchain & Ethereum Solidity Programming

C. Operation of the Blockchains

35. Ecosystem Components
36. Blockchain Operation Models
37. Proof of Work and Stake Consensus Models
38. Round Robin Consensus Model
39. Decentralized Consensus
40. The Blockchain and Blockchain Services
41. Smart Contracts
42. Smart Property
43. Small Programs or Scripts
44. Trusted computing or Trustless Transactions
45. Emerging segments for Blockchain Apps
46. Players and actors
47. Creating a new Blockchain
48. Creating blocks
49. Permissioning the network
50. Adding/removing Blockchain operators
51. Ledger Conflicts and Resolutions
52. Principle of Forking
53. What is a Bitcoin Fork
54. Role of ConsensusSoft Forks
55. Hard Forks
56. Cryptographic Changes and Forks
57. Smart Contracts
58. Blockchain Categorization
59. Permissioned Permissionless
60. Use Case Examples

D. Bitcoin and Cryptocurrency Technologies

61. A Simple Cryptocurrency
62. Building Blocks of Cryptocurrency
63. Cryptographic Building Blocks ("primitives")
64. Security
65. Construct Simple Cryptocurrencies
66. Cryptographic Hash Functions
67. Hash Pointers and Data Structures
68. Digital Signatures
69. Public Keys as Identities
70. How does Bitcoin work?
71. Bitcoin and other Cryptocurrencies

E. Overview of Blockchain Platforms

72. Cryptocurrencies 101
73. Bitcoin (BTC)
74. Bitcoin Transactions
75. Bitcoin and Anonymity
76. Bitcoin Scripts
77. Applications of Bitcoin Scripts
78. Bitcoin Blocks
79. The Bitcoin Network
80. Hot and Cold Storage
81. Splitting and Sharing Keys
82. Online Wallets and Exchanges
83. Payment Services and Transaction Fees
84. Currency Exchange Markets
85. Bitcoin Cash (BCC)
86. Dash (DASH)
87. Ethereum (ETH)
88. Ethereum Classic (ETC)
89. Hyperledger
90. Hyperledger Burrow
91. Hyperledger Fabric

92. Hyperledger Indy
93. Hyperledger Iroha
94. Hyperledger Sawtooth
95. IOTA
96. Litecoin (LTC)
97. MultiChain
98. Ripple (XRP)

F. Bitcoin Mining

99. Bitcoin Miners
100. Mining Hardware
101. Energy Consumption
102. Mining Pools
103. Consensus in Bitcoin
104. Bitcoin Core Software
105. Bitcoin as a Platform

G. Blockchain and Smart Contracts

106. Public, Hybrid/Consortium Blockchain
107. Private Blockchain
108. What are Smart Contracts?
109. Ethers Basics
110. Ethereum Landscape
111. Ethereum Programming Language
112. Solidity 101
113. DApps and DAOs
114. Ether and Accounts
115. Ethereum Client Configuration
116. Working with Contracts
117. Ethereum Private Network
118. Set up an Ethereum Private Network
119. Contract Classes, Functions And Conditionals
120. Inheritance And Abstract Contracts
121. Libraries

- 122. Types, Arrays, Structs and Mappings
- 123. Global Variables
- 124. Test Cases
- 125. User Transactions

H. Programming Blockchain

- 126. Blockchain Coding
- 127. Problems with developing Blockchain software
- 128. Blockchain Security
- 129. Resource Management
- 130. Performance
- 131. Isolation
- 132. Memory Control
- 133. Threading
- 134. Move Semantics
- 135. Compile Time Polymorphism
- 136. Run time Polymorphism
- 137. Function and Operator Overloading
- 138. C++, Javascript, Solidity and Python
- 139. Creating the Block
- 140. Code Analysis
- 141. Elliptic Curve Cryptography
- 142. Signing and Verifying Messages
- 143. Parsing Transactions
- 144. Signing Transactions
- 145. Creating Transactions
- 146. Foundational Math
- 147. ECC and Signatures
- 148. Verification and Addresses
- 149. Transaction Parsing
- 150. Script parsing and processing
- 151. Address construction
- 152. Private Key
- 153. Parsing Blocks
- 154. Validating Proof-of-Work

CLASS ROOM TRAINING – ONLINE AND OFFLINE

The training includes Single user Classroom / laboratory teaching, learning and simulation software module. The content has easy explanation of various complex topics with animation and simulation for ease of student learning. It also supports learning through videos, graphs, charts, along with mandatory rich content and theory to understand fundamental concepts, interactive learning objects, FAQ, MCQ etc. The content is supplied in digital online access or license protection.

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