

Blockchain

Description

Blockchain training is conducted by the real-time expert with real-time scenarios. The blockchain is nothing but a digital record of all the transactions of the economy without missing of data, misuse, manipulation and forgery and mainly incorruptible. It is a Distributed DataBase, with the help of blockchain technology and we can host the transactional data by millions of computers at a time and we can retrieve the data at any time, this data is not available for the hacker to corrupt.

Expectations and Goals

We will learn about –

- Students can take advanced Python courses and build real projects with it.
- Students may build upon the Python and Blockchain knowledge gained in this course and start working on their own Blockchain.
- Students can dive into Web Development or Data Science with Python.

Prerequisites

- Developers with Object Oriented Language experience is required.
- Should have a fundamental knowledge of Linux and Command Line.
- Having a fundamental knowledge of JavaScript are beneficial.

Course Schedule

Module	Topic
Module 1	Introduction What is Python? Setting Up Python Running Python 3 as a Default Writing our First Python Code What is the Blockchain? History of Blockchain Explaining Distributed Ledger Blockchain ecosystem Explaining Distributed Ledger Types of Blockchain Private/Consortium/Permission-less Public/Permissioned implementation difference What Blockchain has to offer across Industry? Companies currently using Blockchain Overview of what we are going to study in this course Key Concepts of the Blockchain Mining -Mining algorithm Node, peer and block explanation Merkle tree and Blockchain Consensus Mechanisms- proof of work , proof of stake How Bitcoin Blockchain works? What is Transaction?
Module 2	Module Introduction Understanding the REPL and Data Types Working with Variables Working with Numbers Using Operators Understanding a "Special" Behaviour when Working with Numbers

	<p>Working with Strings Working with Lists Adding & Removing List Items Preparing the Blockchain - The Theory Installing our IDE Using Functions to Add List Items Blockchain Theory: Understanding Blocks Accessing the Last List Item Adding Arguments to Functions Understanding the "return" Keyword Using Default Arguments Working with Keyword Arguments Using the "input" Function Avoiding Repetitive Code Execution Understanding the Variable Scope Exploring the Official Documentation Adding Comments and Doc Strings Structuring Multi Line Code in Python</p>
Module 3	<p>Understanding Loops - Theory Creating a "for" Loop Creating a "while" Loop Closing the REPL Understanding Conditionals - Theory Adding "if-else" to our Blockchain Working with "elif" Understanding "break" & "continue" Improving our Code with Loops & Conditionals Understanding Boolean Operators - "is" & "in" The "not" Keyword Understanding "and" and "or" Grouping Conditionals What About "switch" in Python? Verifying our Blockchain Blockchain Theory: Understanding Blockchain Verification Using Conditions inside the "while" Loop Using "else" in Loops Adding the "range" Function</p>
Module 4	<p>Understanding the Required Data Structure for our Blockchain Working with Iterables Choosing the Right Datastructure Transactions with Dictionaries & Tuples Blockchain Theory: Understanding Transactions Unpacking the Tuple Mining Blocks Hashing Previous Blocks Understanding List Comprehensions And What are Dict Comprehensions? Combining List Comprehensions & "if" Improving the Blockchain Validation Logic Managing a List of Participants in the Blockchain Calculating Balances Rewarding the Miners of our Blockchain</p>

	<p>Verifying Transactions</p> <p>Understanding Reference vs Value Copying</p> <p>Working with the Range Selector</p> <p>Understanding Shallow vs Deep Copies</p> <p>Comparing "is" & "=="</p> <p>Diving Deeper Into Iterable Methods</p>
Module 5	<p>Exploring the Python Standard Library</p> <p>Importing Packages - Theory</p> <p>Importing "hashlib" to Create a Unique Hash</p> <p>Blockchain Theory: Understanding Hashes</p> <p>Using Other Import Syntaxes</p> <p>The "Proof of Work"</p> <p>Blockchain Theory: Understanding the "Proof of Work"</p> <p>Adding the Proof of Work to our Blockchain</p> <p>Including the Proof of Work in our Mining Function</p> <p>Fixing a Hash Order Fault</p> <p>Splitting Up our Code</p>
Module 6	<p>Handling File Access</p> <p>Reading Data From a File</p> <p>Reading Multi-Line Content</p> <p>Using the "with" Block Statement</p> <p>Adding File Access to our Blockchain</p> <p>Converting Strings Into Python Objects</p> <p>Storing Data with Pickle</p> <p>Comparing Pickle & JSON</p> <p>Changing the Project Back to JSON</p> <p>Why we need Proper Error Handling</p>
Module 7	<p>What is Object Oriented Programming?</p> <p>Understanding Classes</p> <p>Creating a Class</p> <p>Comparing Classes, Instances & Dictionaries</p> <p>Understanding Class Attributes</p> <p>Constructor & Instance Attributes</p> <p>Printing Classes with Special Methods</p> <p>Private & Public Attributes</p> <p>Understanding Inheritance</p> <p>Planning Blockchain Classes</p> <p>Adding a "Block" Class to the Blockchain</p> <p>An Issue with Default Arguments</p> <p>Saving Custom Class Objects via .json</p> <p>Adding a "Transaction" Class</p> <p>Inheritance in Action</p> <p>Adding a "Verification" Helper Class</p> <p>Initialising the "Node" Class</p> <p>Turning the Blockchain Into a Class</p> <p>Adding a "Node" Class</p> <p>Understanding "Instance" vs "Class" vs "Static Methods" & "Attributes"</p> <p>Using "Static" & "Class" Methods on the "Verification" Class</p>
Module 8	<p>Introduction to Ethereum</p> <p>Ethereum: Blockchain with smart contract</p> <p>What is Ether?</p> <p>Bitcoin vs Ethereum Blockchain</p>

	<p>What is Ethereum wallet?</p> <p>What is Smart Contract?</p> <p>Ethereum clients</p> <p>Geth Introduction</p> <p>Setting up Private Blockchain using Geth</p>
Module 9	<p>Learn Solidity</p> <p>Introduction to solidity</p> <p>Hands on solidity</p> <p>Understand and implement different usecases</p> <p>Implement and deploy smart contract on Blockchain</p> <p>Implement Dapp</p> <p>Setting up the environment</p> <p>Implement and deploy your first Dapp</p> <p>Different usecases for implementation of Dapp</p> <p>Future Scope</p> <p>Talk about the future of the Blockchain</p> <p>What is Hyperledger?</p> <p>What is Hashgraph?</p> <p>Discussion on current research on Blockchain</p> <p>Understand current industry challenges and needs</p>
Module 10	<p>Project work and documentation</p>