encode
CLUB

Algorand Bootcamp

Introduction

- Lalith Medury
- Smart Contract and Full Stack Dev
- Building on Algorand since 2020
- Participated in several Encode club hacks and accelerators

Bootcamp basics

- 8 week programme
- Mostly Algorand, but blockchain in general will also be discussed
- Smart contract, dApps, and projects
- Frontend dev, SDKs, and APIs also in scope

Bootcamp agenda

- **Week 1**: Introduction, and benefits of Blockchain
- **Week 2**: TEAL and PyTEAL overview, fundamentals of Algorand
- **Week 3**: PyTeal data structures and operators
- **Week 4**: Control flow
- **Week 5**: State access and manipulation (build a voting dApp)
- **Week 6**: Algorand Standard Assets
- **Week 7**: Frontend
- **Week 8**: Project finale

Week 1

Introduction and Benefits of Blockchain

Fundamentals

Cryptography 101

- Study of techniques for secure communication in presence of enemies

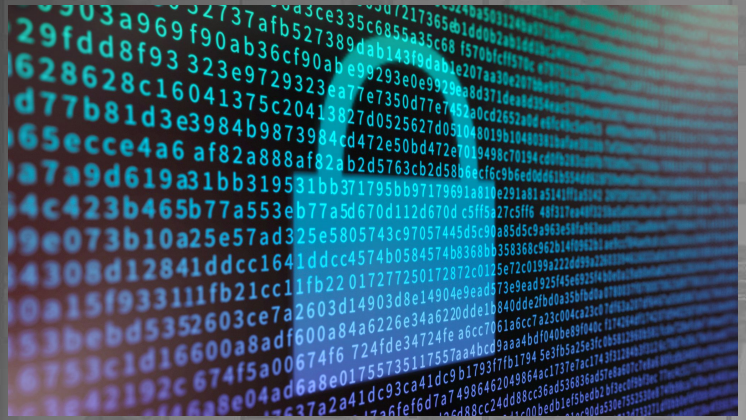
- Most often, it means - converting plain text to cipher text and back

- Objectives:
  - Confidentiality
  - Integrity
  - Non-repudiation
  - Authentication

Confidentiality

- Information can only be read by intended participants

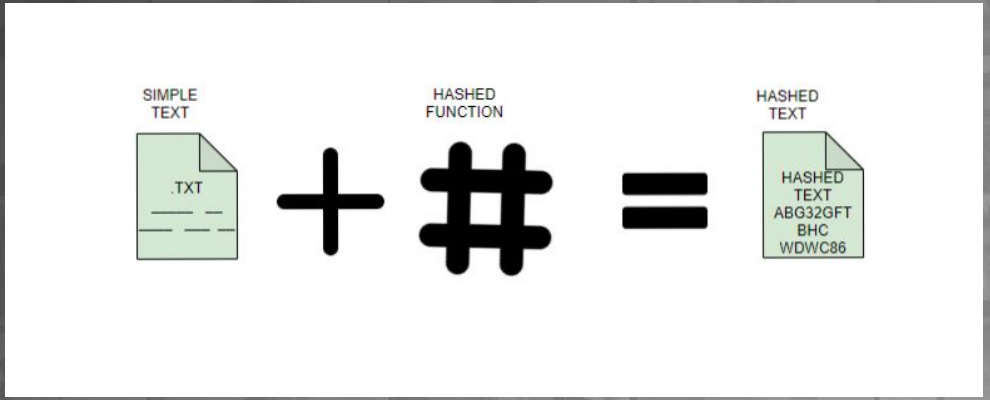
- How are we going to achieve that?



Encryption

Integrity

- Data cannot be altered in storage
- Data cannot be altered in transit
- How are we going to achieve that?



Hashing, and Message Authentication Codes

Non-repudiation

- Sender cannot deny sending data

- How are we going to achieve that?

Digital Signatures

Authentication

- Participants can confirm each other’s identity

- How are we going to achieve that?

Digital Signatures

Why does it matter though?

Cryptography
(in blockchain)

- Encryption
- Immutability
- Security
- Scalability
- Non-repudiation

Blockchain

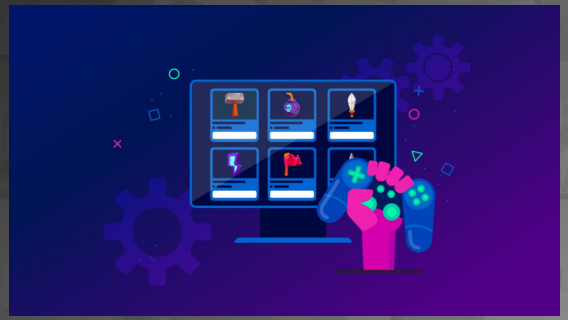
Before we start, why bother to understand blockchain?

Why understand?

- Develop on blockchain
- Use blockchains
- Use different services on blockchain
- Invest in cryptocurrencies

Uses

- Crypto
- Smart contracts
- Financial services
- Games
- Supply chain
- Domain names



And, because.....


HEY LISTEN, I
HE SHOWED THIS N


I bought a dip, but it keeps dipping


When you see other people buying the dips
You guys still have money?


BUY THE DIP
IT'S DONE DIPPING RIGHT?
IT'S DONE DIPPING RIGHT?


HOLD !
HOLD !!
SELL!!
NOW !!!


WHEN YOU HAVENT
CHECKED THE BITCOIN PRICE IN 3 MINUTES

Intro

(what we all know)

- Distributed database or ledger
- Transactions
- Blocks are cryptographically linked
- Tamper-resistant

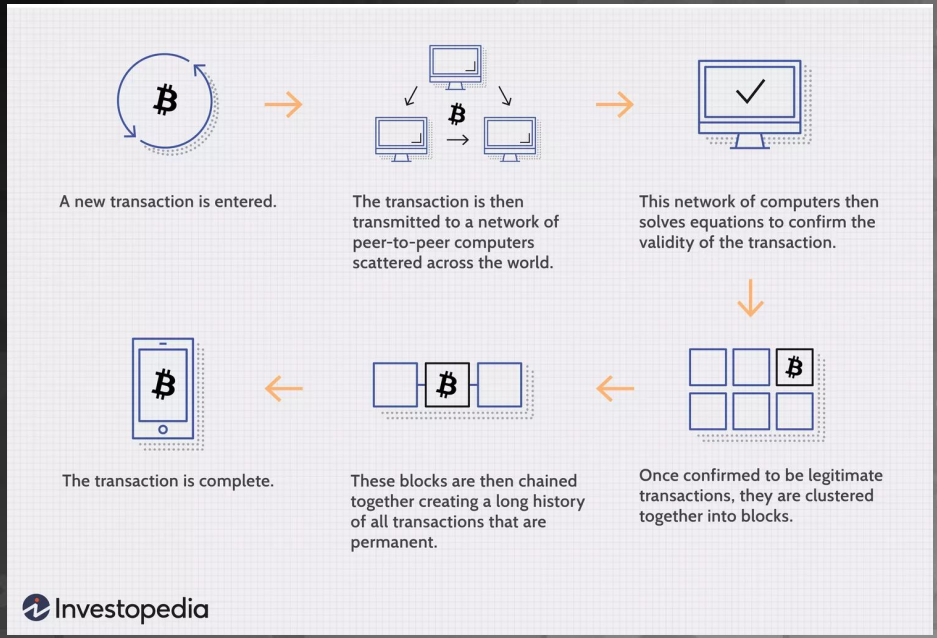
Use-cases

- P2P transactions
- Smart contracts
- Distributed ledger
- Append-only database

Fundamentals

- Transactions
- Blocks
- Cryptography
- Consensus mechanism

Flow



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What is consensus?

- Fault tolerant mechanism to achieve agreement on a state
- Ideally a fair, real-time, functional, reliable, and secure mechanism
- Several algorithms

Examples

- Proof of Work (PoW)
- Proof of Stake (PoS)
- Delegated Proof of Stake (DPoS)
- Pure Proof of Stake

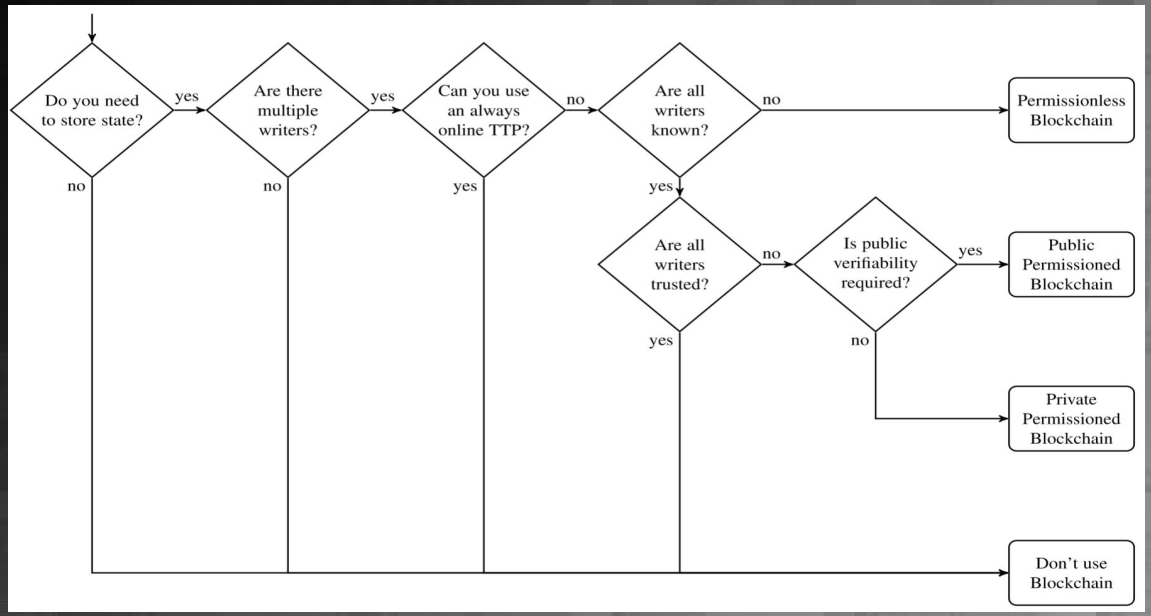
Types of blockchain

- Public blockchain networks
- Private blockchain networks
- Permissioned blockchain networks
- Consortium blockchains

Challenges

- No KYC
- Immutable data
- Not very mature
- Difficult to integrate into legacy systems

Blockchain?



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Why Algorand?

On a very high level

- Low cost transactions
- Instant finality
- No hard fork
- High throughput

Getting technical

- Select a block proposer and a set of voting committees at each block round, to propose a block and validate the proposal, respectively

- The proposer and committees are randomly chosen from the pool of all token holders.

$ALGO

- Native currency
- Holders can participate in consensus
- Pay transaction fees
- Minimum balance deposits to store data on-chain

Fees

- Minimum transaction fee: 0.001 ALGO
- Can pay more ALGOs to prioritize acceptance into a block when network traffic is high
- No concept of gas fees on Algorand

Advantages

- Completely open and permissionless
- Anyone, anywhere in the world owning ALGO can participate in consensus
- Open-source protocol, nodes exist all across the world

Advantages

- Lack of forking
- High performance
- High throughput:
  - Blocks are produced every 3.9 seconds
  - Each block can hold upto 25k transactions
  - ~6000 TPS

Ecosystem


//////Algorand Ecosystem Overview /////
Tools
AlgoExplorer
AlgoScan
Goalseeker
NFTExplorer
Tinychart
AlgoScout
Algorand Testnet Dispenser
AlgoDispenser
TinyHero
AlgoCharts
AlgoOptimizer
Algogator
Algorandstats
AlgoBasket
AlgoPulse
AlgoAlert
AlgoCurator
Sign.net
Asalytic
NFT, Art & Music
AS2 Gallery
Rocket Insights
AlgoGems
ArtSquare.io
Rand Gallery
OG2D
Zestbloom
Uncopied Art.
Dartroom
Epoch Gallery
Aorist
Artory
AlgoxNFT
ANote Music
Musa
VSCO
Gif Economy
Opulous
Abris.io
EasternBlue
Dahai Art
Dequency
SIAE
Asalp
Meadow Labs
Monarch NFV
Investors
Hivemind Capital
Arrington XRP Capital
Skybridge Capital
Borderless Capital
Valhalla Private Capital
Community, DAO
AlgoFAME
Webblen
DEGEN
Coffeebean Dao
1circle
Payment
Bleumi
Payscript
Alchemy Pay
Bnext
Six Clover
Mapaycorp
Wyre
andpay
Pago Service
Atpay
Alty
Xayo App
BallPort
Gaming
Cosmic Champs
Drone Racing League
Flex NBA
Polynize
RainHero Games
RALLY
Shosha
Smile Coin
STADIO
WorldChess
zCircuit
Zone by XTZ
Algo Clash
Cross-Chain
Algomint
Aramid Finance
C3 Protocols
Curate
DuckDAO Incubator
EYWA
Ferrum Network
Glitter Finance
ICON Foundation
pNetwork
StakerDao
Asset Management
AlgoDesk
Prismatic
Domani
Securitize
Exodus
ToolsX
Enigma Securities
NAX
Crypto Smart
Stablecoin
Algogard
e-Money
EURS
QCAD
STBL
USDC
USDT
xBacked DAO
Dex
Tinyman
Algodex
Defly
Pact
HumbleSwap
Equito Finance Dex
Vibrant Xchange
WAGMIswap
Authentium
Oracle
Algoracle
Tellor
Algorand Ecosystem
Service Platform
Algodrop
ARCC
Bloosport.one
ChoiceCoin DAO
DeCHO
FairMeme
FundStack
Republic
WayruNetwork
ASA Wallet
Pera Wallet
My Algo Wallet
Method Wallet
Algosigner
Partners
Rocket Insights
BSN
IBF Net Group
Watr Foundation
Looptribe
Bleumi
Mentat
Reach
Email
Nona Digital
Cartan
Koibanx
Block Chain Italia
IntellectEU
Applied Blockchain
Metaverse
Nocturn.Fi
Playground Labs
Xfinite
P2P
EXA Finance
JaySources
Quantez
Real Estate
Vesta Equity
Lofty AI
PocketProperties
QuantmRE
Realio
LiquidVinyard
Environment
Planet Watch
GreenClimate DAO
Climatetrade
Plandail
IUCN
ePioneers
SEA Nexus
CrowdX
Digital ID
AiDi Tech
Aikon
FlexID
LoginID
Vendible
Vitalpass
Development
AwesomeAlgo
Headline
Tatum
Citrust
Decentology
Algorithm
Runtime Verification
Milkomeda
Staking, LP
Yieldly
ElementDefi
Algostake
Financial Service
Ledgermatic
Copper
BridgeTower Capital
Simetria
Maker Group
Nimble Insurance
DeFiMono
Lending Protocol
Folks Finance
AlgoFi
Alandia
Genesis
Automobile
CDK Token
Reapital
Derivatives
ISDA
Theta Nuts
fxdx
Gambling
AlgoVegas
Mercury Labs
Venue One
Zenny Casino
.algo Domain
ANS
NF Domains
\\\\\Presented by 1circle & TigerChi Team\\\\\

Tools

- AlgoExplorer

- Goalseeker

- Testnet Dispenser

NFT, Art & Music

- Rand Gallery 
- AB2 Gallery 
- Dequency 

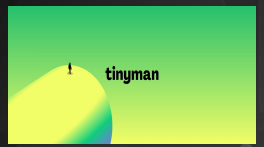
- AlgoXNFT 

Investors

- Borderless Capital
- Arrington XRP Capital
- Skybridge Capital

Dex

- Tinyman



- AlgoDex

- Defly

- HumbleSwap

Wallets

- Pera
- MyAlgo
- Algosigner

Next week

- Dev Environment Setup
- Introduction to Algorand Infrastructure (Tools, SDKs, APIs)
- DApp overview
- Teal and PyTeal overview

Thank You

Email: hi@lalithmedury.com

Twitter: @LalithMedury

Web: https://lalithmedury.com

Email: info@encode.club

Twitter: @encodeclub

Web: https://encode.club