



# Web3 Cohort by 100xDevs

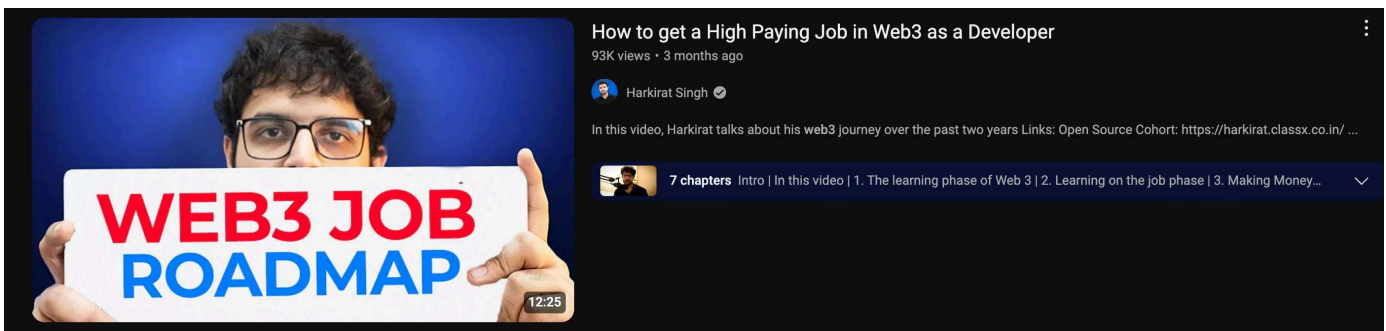
## Goal

To create a Cohort of people who are great at Blockchains, Web3.

## My background in Web3

Detailed video – <https://www.youtube.com/watch?v=gYK8azCYjnU>

Started working in Sept 2022. Worked at ~3 companies since. Primarily worked at Wallets, Exchanges and Gambling websites.

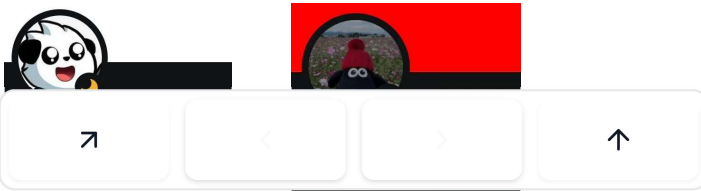


## Syllabus

**Easy** – <https://blog.100xdevs.com/Web3-Client-side-9375f2aa571f4644aa45c3b5a5b6927c?pvs=25>

**Hard** – <https://blog.100xdevs.com/Web3-Contracts-ce3796e9db0e45708bc173f718b23392>

## TAs





1. <https://github.com/code100x/stake> – **Harkirat Singh**
2. <https://github.com/code100x/tiplink> – Led by **@cb7chaitanya**, mentored by Harkirat

If you want to propose a project, please build a v1 for the Superteam hackathon and we can sponsor it further

# Cohort 3.0 Exclusive Hackathon

Link – <https://earn.superteam.fun/listings/project/100xdevs-solana-mini-hackathon-1/>

We're doing an exclusive hackathon with \$100 prize for the top 50 submissions

## Judging Criteria

1. Did you build a project on Solana?
2. Did you build a thoughtful onboarding experience?

oken extensions, blinks, solana mobile stack, etc.

Focus on UX. Have a live link deployed.



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## Project ideas

1. Web3 Zapier – <https://build.superteam.fun/ideas/automated-workflows>
2. Whale Alert – <https://x.com/cyversalerts/status/1813834131165286464>
3. Liquidating an NFT to a token – <https://build.superteam.fun/ideas/liquidating-an-nft-to-any-token>
4. NFT viewing gallery (maybe in 3D) – ▶
5. Decentralized Fiver – End to End job portal to hire solana devs, pay them, escrow money from the job provider.
6. RPC aggregator – Let a user put in a bunch of RPCs from various providers (Helius, Alchemy, QuickNode) and you should figure out which one to forward requests to (Similar to <https://www.ironforge.cloud/> )
7. Wallet adapter for a web based wallet – ▶
8. Youtube channel opinions market – Let people trade on a coin associated to a Youtube channel. Creator can come and collect royalties by connecting their YT account. <https://www.youtube.com/watch?v=PZNgcH2Jtac>
9. Tiplink (even tho we're building it separately, if you want to build a better version with a twist, you should do it)
10. Github Bounty Dispenser. Make users give their Adhar/Pan. Make users link their github with their wallet address. Allow maintainers to approve bounties. Create a dashboard where you can track profiles of users/companies and a leaderboard of contributors based on bounty earned
11. UI Library for Solana – NFTCard, TokenCard, SwapCard



# Why blockchains?

## Inflating currencies

Government has been printing currencies left right and center. This leads to increasing inflation, price of everything goes up.

Holding on to cash is a losers bet in the long run. Holding on to any asset (Gold, Stock, real estate) is better compared to currencies like USD, INR.

## Fractional reserve Banking

Banks dont have your money. They lend out most of it.

If there is a bank run (everyone goes to the bank to withdraw their money), banks wont be able to pay everyone

Silicon valley collapsed in 2022. I was in the US when it happened. Most YC companies had their funds in SVB. They were bailed out, but if not, you would've seen a lot of startups die.

## Bailouts

The 2008 Financial crisis was triggered by a financial instrument called mortgage-backed securities.

Even though the banks at Wall Street were at fault, the government ended

ney.



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Big Short. I've watched it ~5 times

## INR Depreciation (even worse in countries like Japan)

1. USD

1. JPY

**Currencies are not backed by assets anymore**

# How to create a new currency?

Right now, currencies can only be issued by central governments. You can't create your own **Kirat coin** and ask users to use it.

Even if I do issue a **Kirat coin**, no one would use it, and for good reasons –

1. I can print any number of Kirat coins, making myself richer

2. I am not a recognized authority for the coin.

3. No one would (or should) trust me



# Intro to hashing

**Hashing** is a process that transforms input data (of any size) into a fixed-size string of characters.

Hash functions have several important properties:

Always produce the same output.

2 **Fast computation:** The hash value can be quickly computed for any



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3. **Pre-image resistance:** It should be computationally infeasible to reverse the hash function (i.e., find the original input given its hash output).
4. **Small changes in input produce large changes in output:** Even a tiny change in the input should drastically change the hash output.
5. **Collision resistance:** It should be computationally infeasible to find two different inputs that produce the same hash output.

## Is this a hashing algorithm?

What if I try “hashing” a string by increasing each alphabet’s value by one. Do you think this follows all the rules we’ve written above?

## SHA-256

Lets try out a famous hash function, SHA-256 here –  
<https://emn178.github.io/online-tools/sha256.html>

## Node.js code for generating SHA-256

```
const crypto = require('crypto');  
  
const input = "100xdevs";  
const hash = crypto.createHash('sha256').update(input).digest('hex');  
  
console.log(hash)
```





# Intro to Proof of work

## Assignment #1

What if I ask you the following question — Give me an input string that outputs a SHA-256 hash that starts with **00000** . **How will you do it?**

**A: You will have to brute force until you find a value that starts with 00000**

▼ Node.js code

```
const crypto = require('crypto');  
  
// Function to find an input string that produces a hash starting with '00000'  
function findHashWithPrefix(prefix) {  
  let input = 0;  
  while (true) {  
    let inputStr = input.toString();  
    let hash = crypto.createHash('sha256').update(inputStr).digest('hex');  
    if (hash.startsWith(prefix)) {  
      return { input: inputStr, hash: hash };  
    }  
    input++;  
  }  
}  
  
// Find and print the input string and hash  
const result = findHashWithPrefix('00000');  
console.log(`Input: ${result.input}`);  
console.log(`Hash: ${result.hash}`);
```







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What if I ask you that the **input string** should start with **100xdevs** ? How would the code change?

## ▼ Node.js code

```
const crypto = require('crypto');

// Function to find an input string that produces a hash starting with '00000'
function findHashWithPrefix(prefix) {
  let input = 0;
  while (true) {
    let inputStr = "100xdevs" + input.toString();
    let hash = crypto.createHash('sha256').update(inputStr).digest('hex');
    if (hash.startsWith(prefix)) {
      return { input: inputStr, hash: hash };
    }
    input++;
  }
}

// Find and print the input string and hash
const result = findHashWithPrefix('00000');
console.log(`Input: ${result.input}`);
console.log(`Hash: ${result.hash}`);
```

## Assignment #3

What if I ask you to **find** a nonce for the following input -

harkirat => Raman | Rs 100

Ram => Ankit | Rs 10

## ▼ Node.js code



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```
// Function to find an input string that produces a hash starting with '00000'
function findHashWithPrefix(prefix) {
  while (true) {
    let inputStr = `
harkirat => Raman | Rs 100
Ram => Ankit | Rs 10
` + input.toString();
    let hash = crypto.createHash('sha256').update(inputStr).digest('hex');
    if (hash.startsWith(prefix)) {
      return { input: inputStr, hash: hash };
    }
    input++;
  }
}

// Find and print the input string and hash
const result = findHashWithPrefix('00000');
console.log(`Input: ${result.input}`);
console.log(`Hash: ${result.hash}`);
```

## Assignment #4

Lets explore <https://andersbrownworth.com/blockchain/>

# Intro to Bitcoin

Bitcoin white paper was released in 2008 – <https://bitcoin.org/bitcoin.pdf>



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## 1. Introduction

## 2. Transactions

## 3. Timestamp server

## 4. Proof of work

## 5. Network

## 6. Incentive