

**Shri Vile Parle Kelavani Mandal's
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(Autonomous)**

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Topic : Building a Blockchain App

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Building a Blockchain App using Solidity

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TECHNOLOGIES USED

What is Solidity?

- Solidity is a contract-oriented, high-level programming language for implementing smart contracts. A smart contract is a computer protocol intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract. Smart contracts allow the performance of credible transactions without third parties.
- Solidity is highly influenced by C++, Python and JavaScript and has been designed to target the Ethereum Virtual Machine (runtime environment for smart contracts in Ethereum). Solidity is statically typed, supports inheritance, libraries and complex user-defined types programming language.

What is Flutter?

- Flutter is a Google-created free and open-source mobile UI framework that was introduced in May 2017. In a nutshell, it enables you to develop a native mobile app using only one codebase. This implies you can design two different apps using the same programming language and codebase (for iOS and Android).
- Flutter consists of two important parts:
 - An SDK (Software Development Kit):
 - A collection of tools that are going to help you develop your applications. This includes tools to compile your code into native machine code (code for iOS and Android).
 - A Framework (UI Library based on widgets):
 - A collection of reusable UI elements (buttons, text inputs, sliders, and so on) that you can personalize for your own needs.

What is Metamask?

- Metamask is a software cryptocurrency wallet used to interact with the Ethereum blockchain. It allows users to access their Ethereum wallet through a browser extension (available in Chrome, Firefox and Brave) or mobile app, which can then be used to interact with decentralized applications.
- On traditional websites, a central database or a bank is responsible for controlling and recovering your accounts. But on Metamask, all of the power belongs to the holder of a master key, whoever holds the key, controls the account.
- With one account we can make transactions in the different networks but each network has its own ether balance and cannot be used across networks.

What is Infura?

- Infura provides the tools and infrastructure that allow developers to easily take their blockchain application from testing to scaled deployment - with simple, cost-effective & reliable access to Ethereum and IPFS. It does not have any complex set-ups also syncing is not required.

What is blockchain technology and how does it work?

The original Blockchain is an open source technology that offers an alternative to the traditional crypto-currency transfer of Bitcoin. Mediator is replaced by integrated ecosystem authentication that provides greater tracking, security and speed.

- An authorized participant inputs a transaction, which must be authenticated by the technology.
- That action creates a block that represents that specific transaction or data.
- The block is sent to every computer node in the network.
- Authorized nodes verify the transaction and add the block to the existing blockchain. (Nodes in public blockchain networks are referred to as miners; they're typically paid for this task -- often in a process called Proof of Work, or PoW -- usually in the form of cryptocurrency.)
- The update is distributed across the network, which finalizes the transaction.

Writing a smart contract in solidity using Remix IDE

- First of all we create a new file and declare the solidity compiler version(i.e. 0.6.6 in our case) by using pragma directive.
- Create a contract using the contract keyword and name it(i.e. UC in our case).
- Then we create an integer variable named `int balance` to store the balance and declare a public constructor to initialize the same.
- Create 3 public functions `getBalance()`, `depositBalance()` and `withdrawBalance()` to fetch the balance, deposit funds and withdraw funds here `int amt` will be the user's input would be passed the the latter two functions as parameter .
- Compile the file and deploy it using Remix IDE(an open source web application).

Working of the Flutter App :

This app helps to withdraw or deposit any amount of UC(Unnamed Coin) using the blockchain technology through solidity .

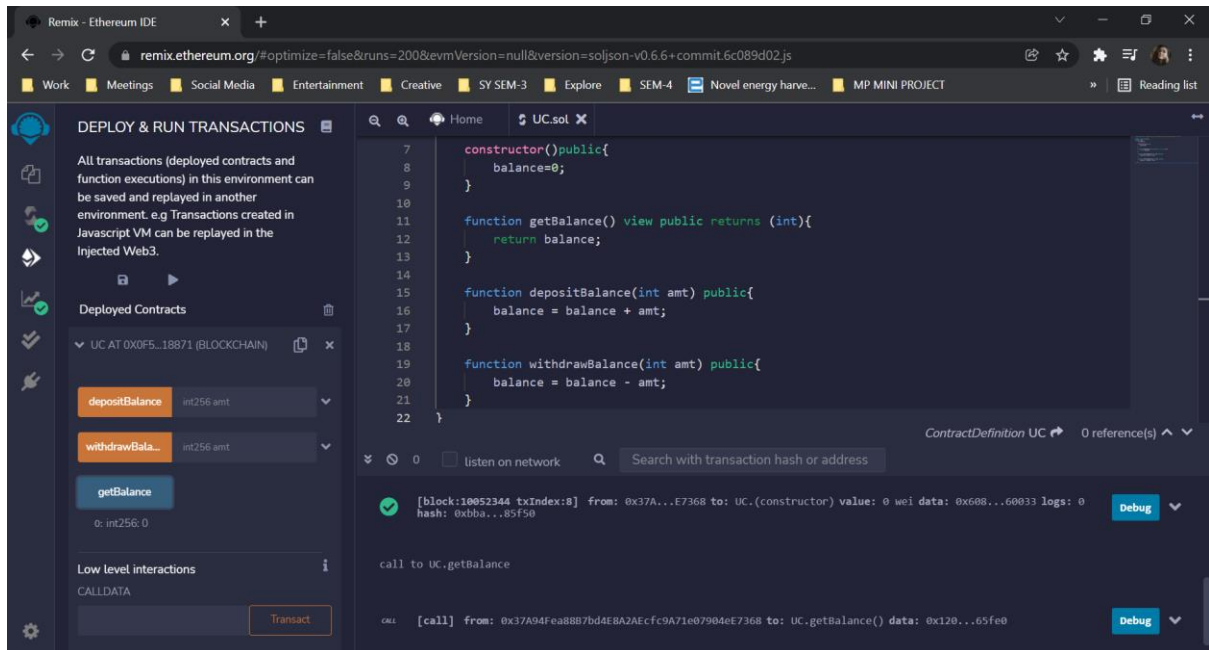
1) Deposit : This will deposit the amount of UC(Unnamed Coin) you select using the slider , this goes to the contract address on the remix ide where we have our solidity code.

2) Withdraw : Select the amount of UC(Unnamed Coin) you want to withdraw using the slider and this then withdraws the amount and sends it to MetaMask.

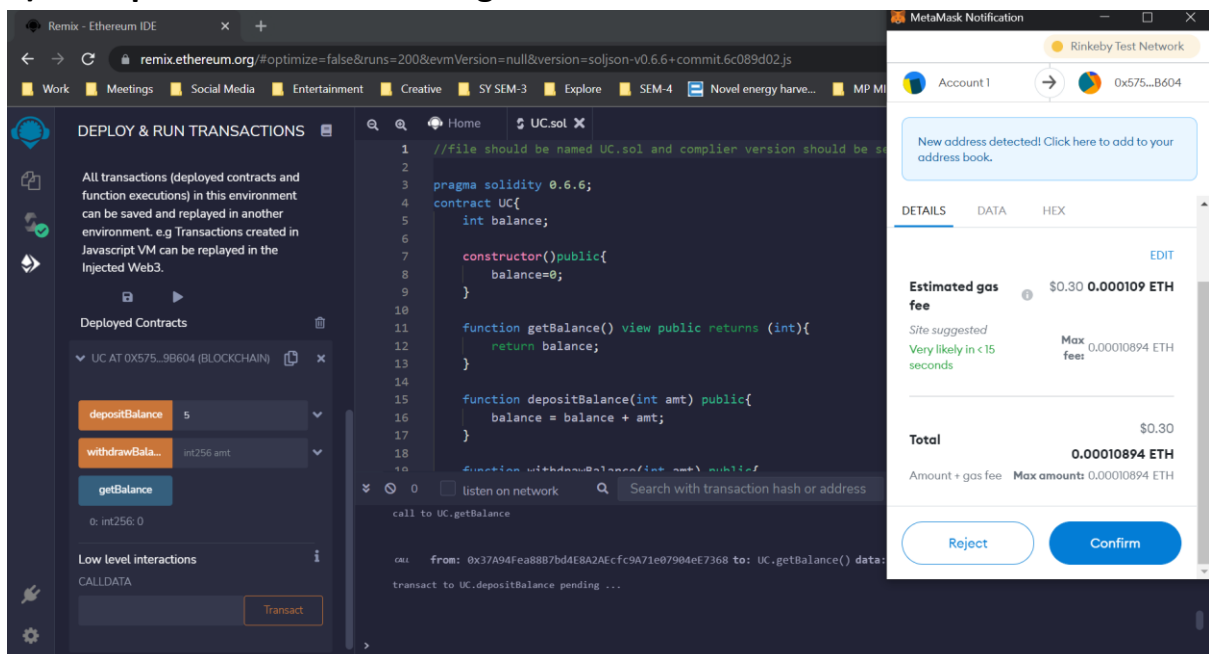
3) Refresh : This just refreshes the screen , resets the slider and updates the balance.

Smart Contract in Solidity

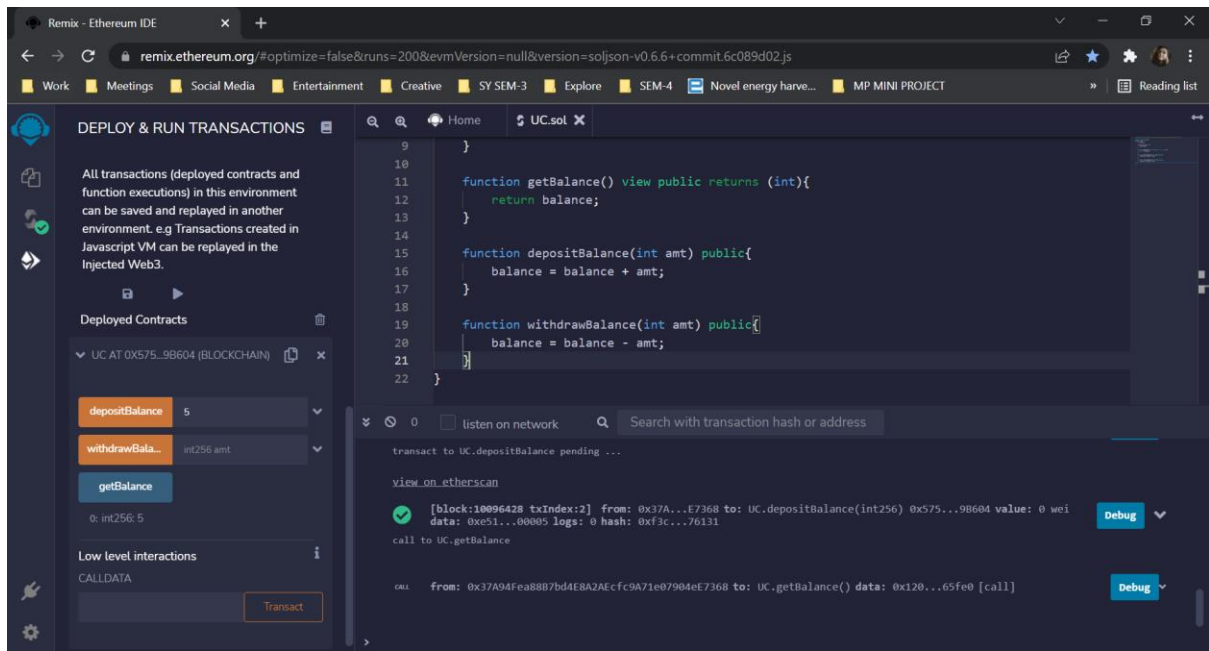
1) Deployed successfully & Initial balance is zero:



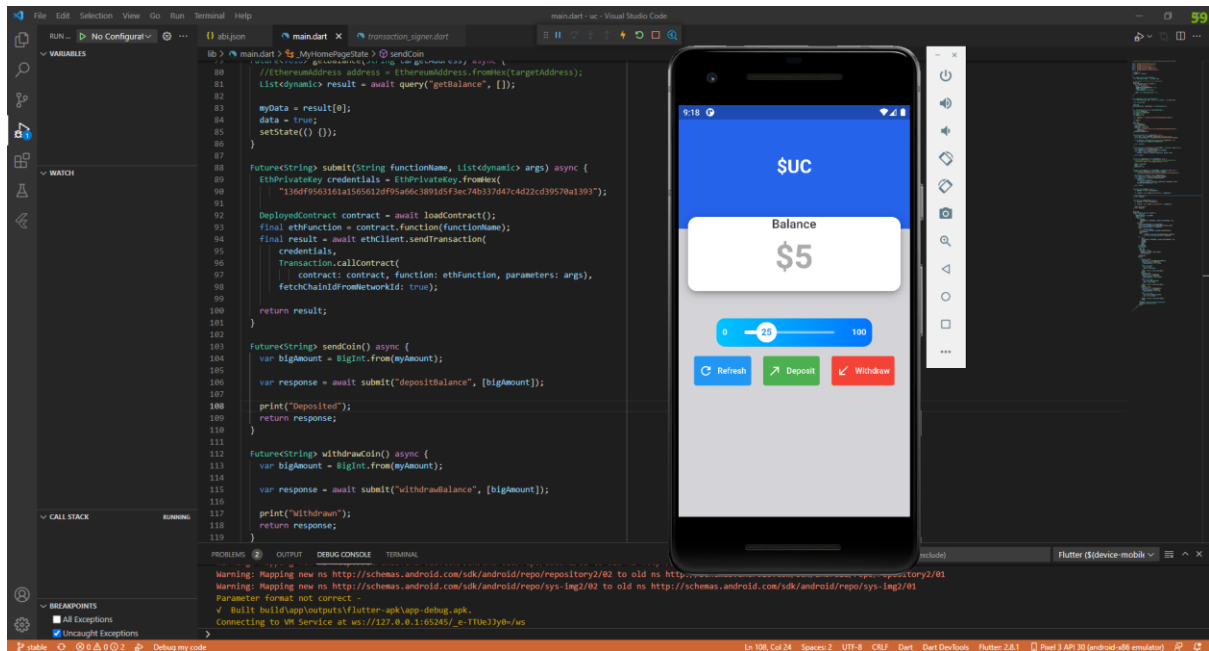
2) To deposit 5UC confirm the gas fee:



3) 5UC got deposited successfully:



Final Output of the Flutter App



REFERENCES

- [Solidity - Wikipedia](#)
- [Solidity Tutorial - A Full Course on Ethereum, Blockchain Development, Smart Contracts, and the EVM - YouTube](#)
- [Solidity — Solidity 0.8.11 documentation \(soliditylang.org\)](#)