

Assignment-2

1) My wallet address :0xBD9FfFa80c5dCB761Cb46ab2ab0211B8D82f41db

2) Ethereum's whitepaper describes a decentralized platform enabling programmable transactions through smart contracts, extending beyond Bitcoin's limited scripting. It introduces the Ethereum Virtual Machine (EVM) for executing Turing-complete code, accounts (both user and contract-controlled), and gas as a computing cost metric. The platform supports decentralized applications (dApps) across finance, governance, and data storage, using Proof of Work (later PoS) consensus with faster block times and the GHOST protocol.

3) ERC-721 contract address :0x318C867DAb4C5Af740E7E655bceb97592a6194bB

4) What is a Wallet ?

A wallet is a digital tool that enables users to securely store, send, and receive cryptocurrencies. It interacts with blockchain networks to facilitate transactions and manage private and public keys, which are essential for ownership and control of digital assets.

Types of Wallets :

Software Wallets :

- **Definition:** Digital wallets that exist as applications or browser extensions.
- **Examples:** Trust Wallet, Coinbase Wallet, Atomic Wallet.
- **Pros:** Easy to use, accessible on mobile and desktop devices.
- **Cons:** Susceptible to hacking if the device is compromised.

Hardware Wallets :

- **Definition:** Physical devices that store private keys offline for enhanced security.
- **Examples:** Ledger Nano S, Trezor.
- **Pros:** Extremely secure since they are not connected to the internet.
- **Cons:** Can be lost or damaged; less convenient for frequent transactions.

Why Wallets Don't Break Decentralization :

Wallets maintain decentralization because:

- They operate independently of centralized intermediaries.
- Private keys remain in the user's control, ensuring true ownership of assets.
- Wallets simply provide an interface to interact with decentralized blockchains, rather than centralizing power or data.

5) The zero address serves as a special blockchain address for burning tokens, contract creation, and uninitialized variable defaults. Due to how Ethereum addresses are cryptographically generated from public/private key pairs, it's computationally impossible to find a private key that would generate the zero address (probability of 1 in 2^{256}). This mathematical impossibility makes it perfect for permanent token burns and as a secure null address.

6) Brave Browser :

A privacy-focused web browser that blocks trackers and ads by default. Users can opt-in to see privacy-respecting ads and earn Basic Attention Token (BAT) rewards. Built on Chromium, it includes features like Tor integration and IPFS support.

BAT Token :

An ERC-20 token powering Brave's advertising ecosystem. Advertisers buy ads with BAT, users earn BAT for viewing optional ads, and can tip content creators.

Key metrics:

- Use case: Digital advertising and creator support
- Protocol: Ethereum (ERC-20)

The system aims to reform digital advertising by removing intermediaries and protecting user privacy while fairly compensating creators and users.

7) ERC-1155 contract address :0xcFDbB3CC7E795F4Cb3B7f0398632383f05Dc8910

ERC-1155 differs from ERC-721 in three main ways:

- 1. Multi-token Standard:** ERC-1155 can handle both fungible and non-fungible tokens in a single contract, while ERC-721 is for NFTs only. One ERC-1155 contract can manage multiple token types.
- 2. Batch Operations:** ERC-1155 enables transferring multiple token types in a single transaction, reducing gas costs. ERC-721 requires separate transactions for each token.
- 3. Gas Efficiency:** ERC-1155 is more gas-efficient due to its optimized data structures and batch functionality. It stores metadata in a centralized database referenced by URI, unlike ERC-721's per-token metadata.

A key use case is gaming, where a single ERC-1155 contract can manage both fungible items (coins, resources) and non-fungible items (unique characters, rare items).

→ **You can also check out my [HD ETH-Wallet repo](#) :** Creating private keys from a Recovery Seed Phrase (like MetaMask)