Blockchain: Smart Contracts

Lab 4

Project Deadline: week 11 and week 12

1. **Each group must select one topic from the project topics list (last slides of this document). Please implement a blockchain project for the selected topic. The topics are general and complex, but you do not need to implement all the functionalities. You can choose 1-2 functionalities that you like to implement. The project must contain at least one smart contract. For the evaluation, the group must prepare 10 slides that must contain:**
    - **Problem description**
    - **Implemented functionalities**
    - **Description of the application architecture- design decisions**
    - **Descriptions of the implemented smart contracts**
    - **Oral presentation ends with a short demo**
    - **Your presentation will take 10 mins followed by my 5 mins questions for each group member**

Project Deadline: week 11 and week 12

2. Each group must select the time slot for the project presentation. You can select one of the following time slots:

- **Monday, 13 May 2024, 12-14, room 321 (5 groups)**
- **Friday, 17 May 2024, 8-10, room 343 (5 groups)**
- **Friday, 17 May 2024, 10-12, room 335 (5 groups)**
- **Friday, 17 May 2024, 12-14, room 339 (5 groups)**
- **Monday, 20 May 2024, 12-14, room 321 (5 groups)**
- **Friday, 24 May 2024, 8-10, room 343 (5 groups)**
- **Friday, 24 May 2024, 10-12, room 335 (5 groups)**
- **Friday, 24 May 2024, 12-14, room 339 (5 groups)**

3. Please write in your selected time slot from the file Projects-time.xml (from ClassMaterials) your group student names and your selected project topic.

Project Topics

1. Decentralised Voting System:

Revolutionise democratic processes by developing a decentralised voting system. Utilising blockchain, each vote becomes a secure and transparent transaction. The decentralised nature ensures that no central authority can manipulate results, instilling trust in the electoral process. Immutability guarantees an unforgeable record, fostering confidence in the democratic system's integrity.

2. Supply Chain Transparency:

Transform supply chain management with a blockchain solution ensuring end-to-end transparency. Every step in the supply chain, from raw material production to the consumer's hands, is recorded on an immutable ledger. Counterfeit products are mitigated, and consumers gain the ability to trace a product's journey. The result is enhanced authenticity, trust, and accountability, meeting the growing demand for transparent and ethical supply chains.

Project Topics

3. Blockchain-based Social Network:

Challenge centralised social networks by creating a decentralised alternative. Users regain control over their data, and interactions are recorded on the blockchain, ensuring privacy and security. This project empowers individuals by allowing them to own their online presence, addressing concerns related to data privacy, censorship, and the misuse of personal information by large corporations.

4. Tokenization of Assets:

Democratise access to traditionally high-value assets through the tokenization of real-world assets. By representing ownership through blockchain tokens, fractional ownership becomes feasible. Smart contracts govern transactions, ensuring transparency and trust among investors. This project opens new avenues for individuals to participate in investments that were previously out of reach.

Project Topics

5. Immutable Academic Credentials:

Modernise academic credential management with a blockchain-based system. Certificates, degrees, and achievements are securely stored on the blockchain, eliminating the risk of fraudulent claims. Employers can efficiently verify academic backgrounds, reducing the time and effort required for hiring decisions. This project addresses issues of credential fraud and provides a reliable, tamper-proof record of an individual's educational achievements.

6. Healthcare Data Management:

Tackle healthcare data management challenges with a blockchain solution. Patient records, treatment histories, and other sensitive information are securely stored on the blockchain, ensuring interoperability and privacy. This project streamlines healthcare processes, enhances data security, and facilitates seamless sharing of information among healthcare providers, ultimately improving the quality of patient care.