DALHOUSIE UNIVERSITY

CSCI6313
Introduction to Blockchains

ASSIGNMENT – 1
PART - B

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Assignment-1 Part-B

Smart Contract:

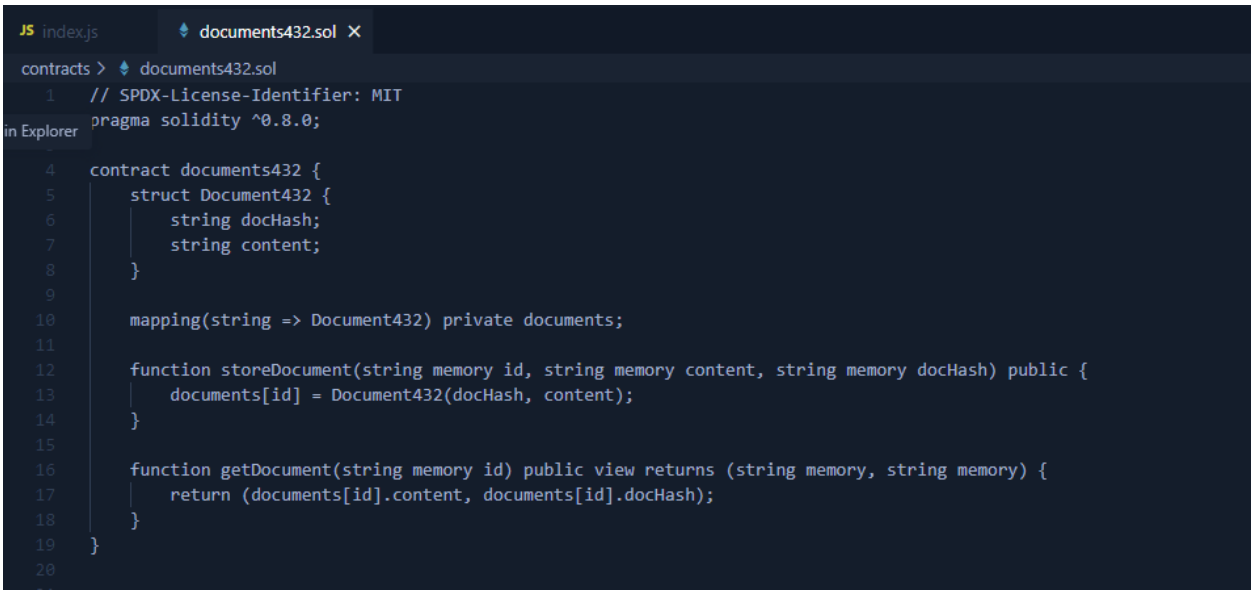

Figure (1): Solidity Code for smart Contract.

- document432: The name of the smart contract.
- struct Document432: A structure to hold document data (content and its hash).
- mapping: A storage mechanism that links a document ID to a Document.
- storeDocument: A function to save a document and its hash.
- getDocument: A function to retrieve a document and its hash.

Truffle Contract Deployment:

Truffle initiated:

Figure (2): Truffle config file.

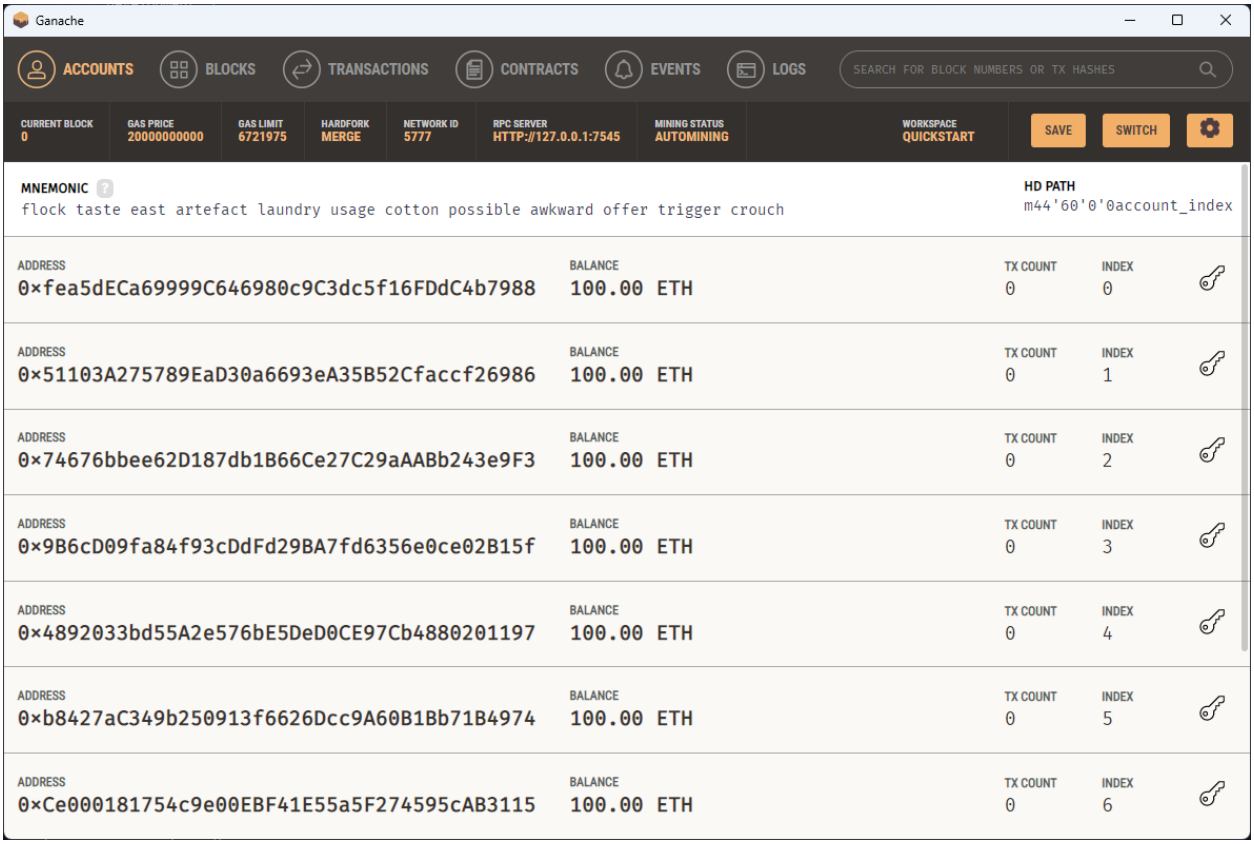

Figure (3): Deployed Blockchain locally using Ganache.

```
async function storeDocument432(docId, content) {
    const docHash = web3.utils.sha3(content);
    const accounts = await web3.eth.getAccounts();
    const result = await contract.methods.storeDocument(docId, content, docHash).send({ from: accounts[0], gas: 3000000 });
    console.log('[B00968432] - Document stored successfully.');
    console.log('[B00968432] - Document Hash:', docHash);
    console.log('[B00968432] - Transaction:', result);
}

async function getDocument432(docId) {
    const result = await contract.methods.getDocument(docId).call();
    console.log('[B00968432] - Document Content:', result[0]);
    console.log('[B00968432] - Document Hash:', result[1]);
    console.log('[B00968432] - Transaction:', result);
}
```

Figure (4): Code to store and get document with hash of the document.

Explanation of Index.js:

- Connect to Ganache: new Web3('http://127.0.0.1:7545') connects to the local blockchain provided by Ganache.
- Contract ABI and address: contractABI is the contract's interface, and contractAddress is the deployed contract's address taken from the json file in the deploy file.
- Functions:
    - storeDocument432: Stores a document's content and its hash.
    - getDocument432: Retrieves a document's content and its hash.
- Command-line arguments:
    - store: Stores a document.
    - get: Retrieves a document.

Truffle compiled and migrated:

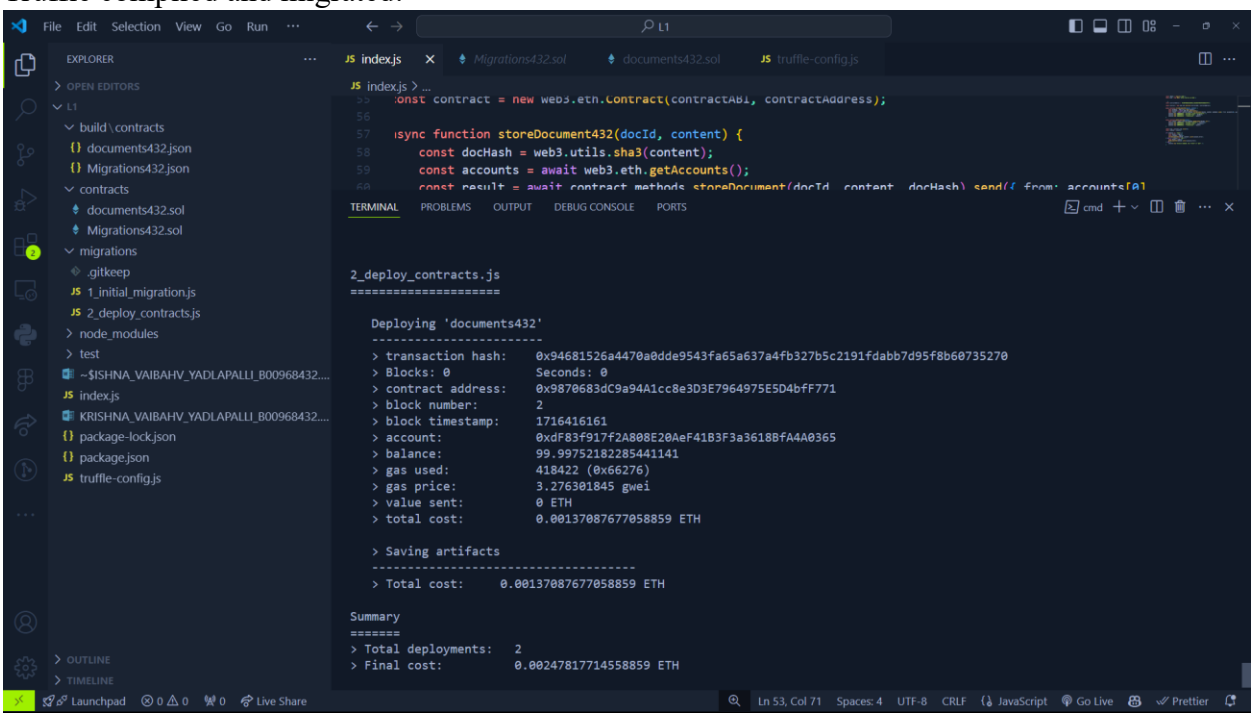

Figure (5): truffle migrated and got a contract address.

Output

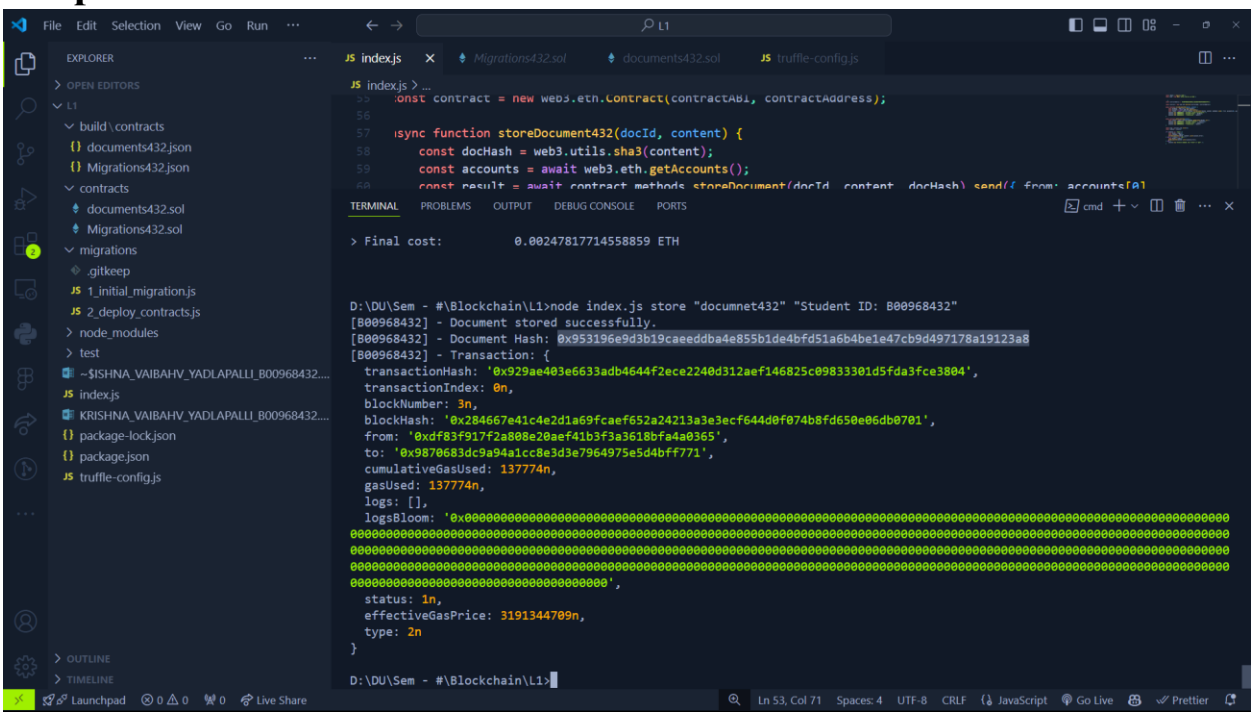

Figure (6): Document is stored successfully.

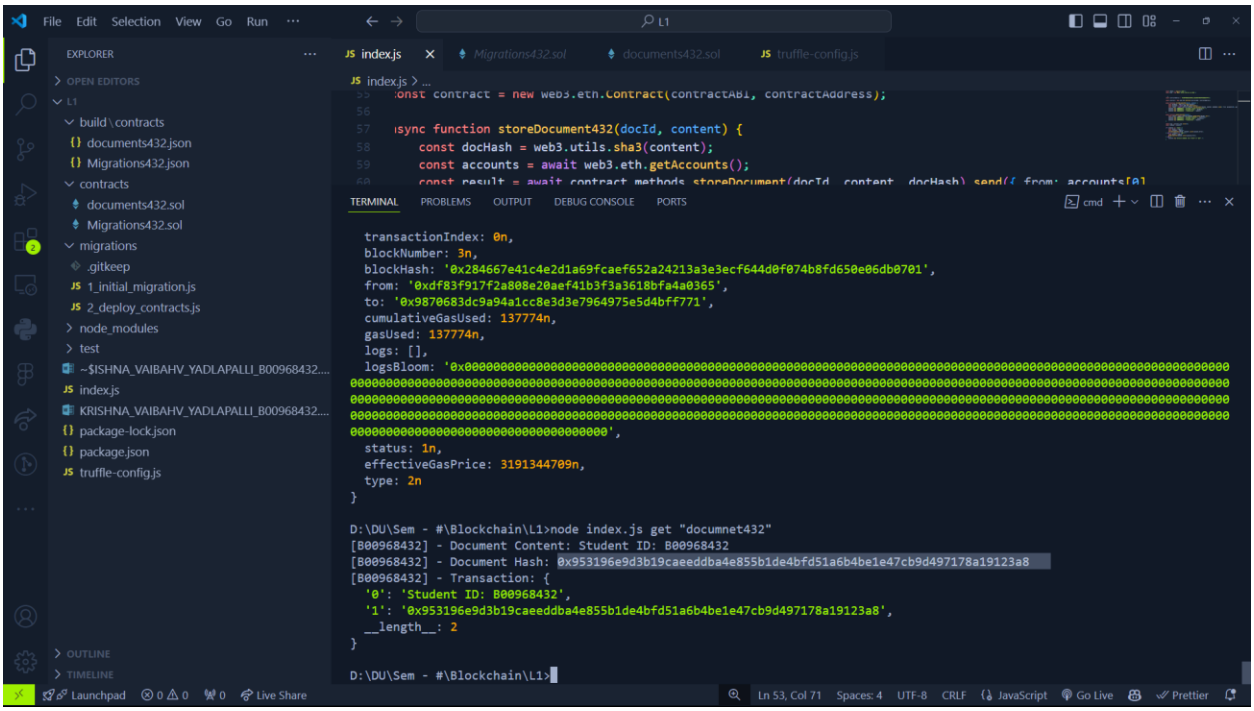

Figure (7): Document retrieved successfully.

Both the store document and get document functions are working successfully, **the hash of the document before and after getting the document are the same as shown in figures 6 and 7** maintaining the integrity of the file.

References

[1] Drchrisliu, "DRCHRISLIU/6313-IPFs," *GitHub*, https://github.com/drchrisliu/6313-ipfs (accessed May 22, 2024).