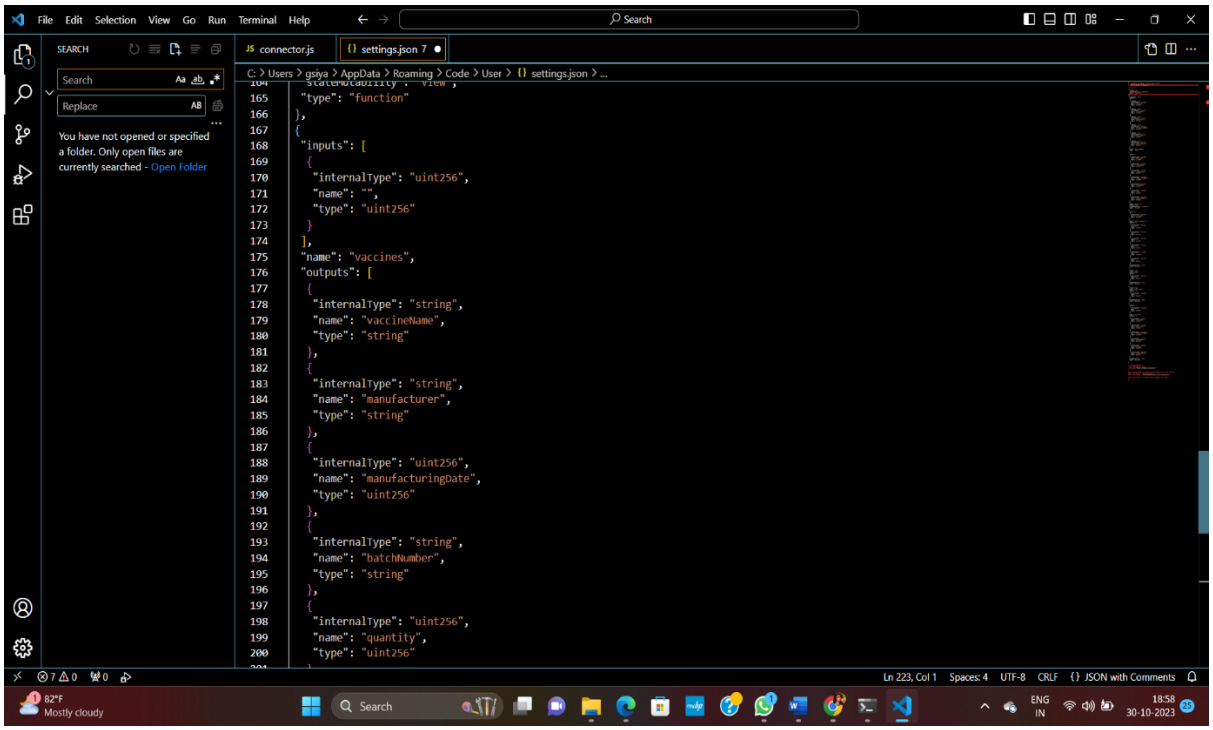
IMPLEMENTATION OF SMART CONTRACT

In today's increasingly interconnected world, ensuring the transparency and trustworthiness of vaccine distribution has become a critical imperative. Many people are hesitant to be vaccinated . It has been reported that people are hesitant to receive vaccines because of the negative information that they have been presented with on social media sites about the side effects of vaccines. In other words, anxiety and the fear of foreign-made, fake, and low-quality vaccines have discouraged vaccination. The circulation of fake vaccine passports to take advantage of loopholes regarding behavioral restrictions placed on those who are unvaccinated is even an issue. the circulation of low-quality and counterfeit vaccines seriously affects human health and the reputation of real vaccine manufacturers (VMs) and increases the amount of fear concerning vaccination. Middle class people cannot afford for the high quality vaccines . This circulation of counterfeit vaccine passports has caused a variety of problems, including nonimmunized people spreading the virus and people who think about getting vaccinated believing that they do not have to face the risk of getting vaccinated and, thus, do not do so. As a result, the ultimate goal of vaccination, which is to achieve population immunity, becomes difficult to achieve

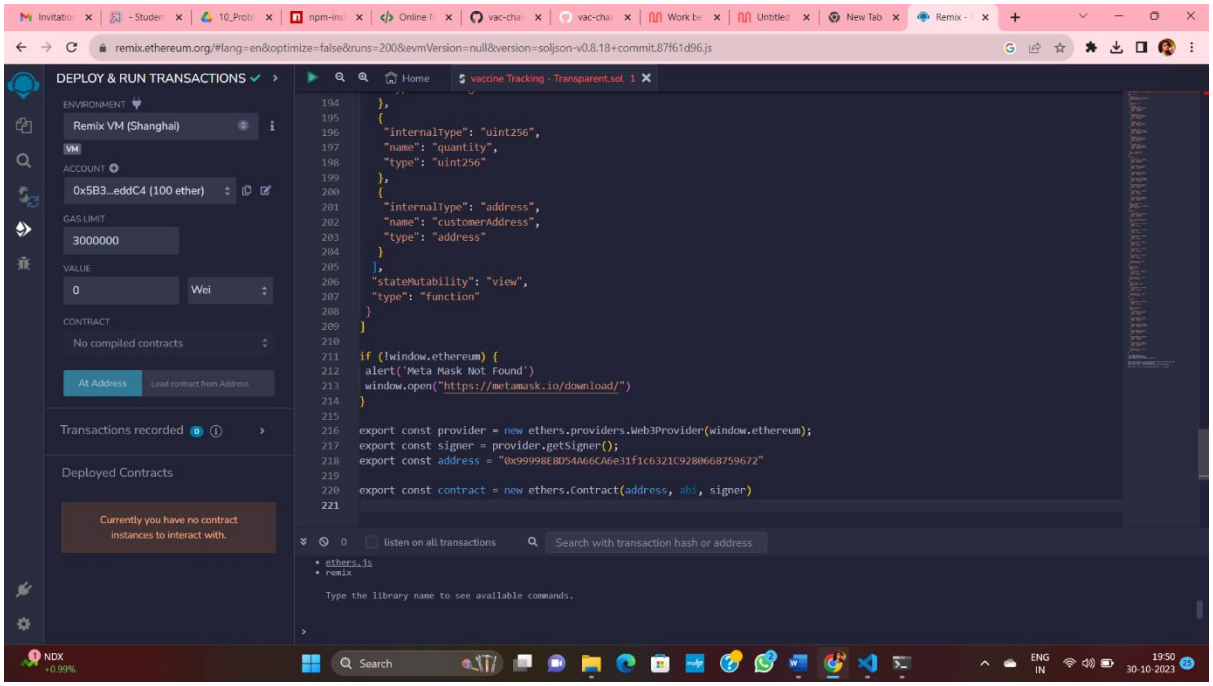
Blockchain came into existence with Bitcoin cryptocurrency. The blockchain system records all transactions in a distributed ledger. Moreover, blockchain is a peer-to-peer (P2P) type of network, which means that all nodes share information by communicating directly with each other, without having a specific server or client. Data are stored in the ledger, and the ledger is decentralized and stored in many computers distributed all around the world. This structure results in one of the important characteristics of a blockchain network, being distributed. Data stored in the ledger cannot be deleted or modified by anyone, which results in the second characteristic, being immutable. Being immutable allows blockchain data to become trustworthy and reliable evidence for many kinds of services. The blocks of the ledger are connected via cryptography hash values to form a chain of blocks .Concretely, each block stores its hash value and that of the previous block. Anyone is able to verify whether the ledger has been tampered with by quickly analyzing the hash value of the final block only, which results in the third characteristic, being transparent, which helps enhance data reliability since data are transparent and cannot be tampered with. Consensus algorithms such as Proof of Work , Proof of Stake , and Byzantine Fault Tolerance , are required to govern the operation of the blockchain network and to guarantee the three abovementioned characteristics: decentralized, immutable, and transparent.

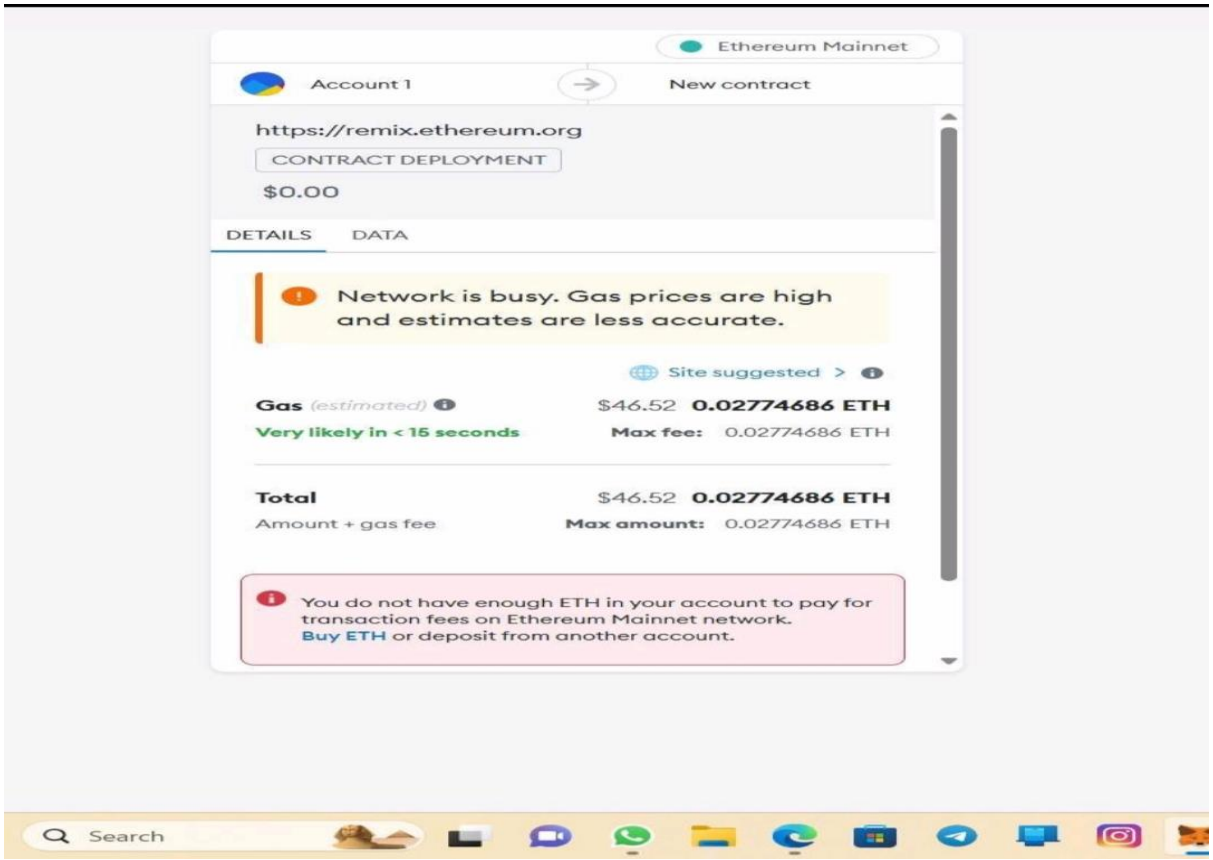
Several development platforms are available for developing blockchain-decentralized networks without requiring sophisticated knowledge on the network infrastructure. The first well-known platform is Ethereum [10], which allows the deployment of smart contracts for developing a distributed application (Dapp). Smart contracts are computer programs that are processed on a virtual computer known as an Ethereum Virtual Machine (EVM). Individuals are able to develop and deploy a Dapp on the existing EVM platform quickly. However, the disadvantage of the Ethereum platform is the high gas fee with a low processing rate. More importantly, the developer is not able to modify the consensus Cryptography 2023, 7, 13 3 of 15 governing the network, meaning that the developer does not have the freedom to upgrade the network's scalability and power consumption.

STEP 1 : compile the code

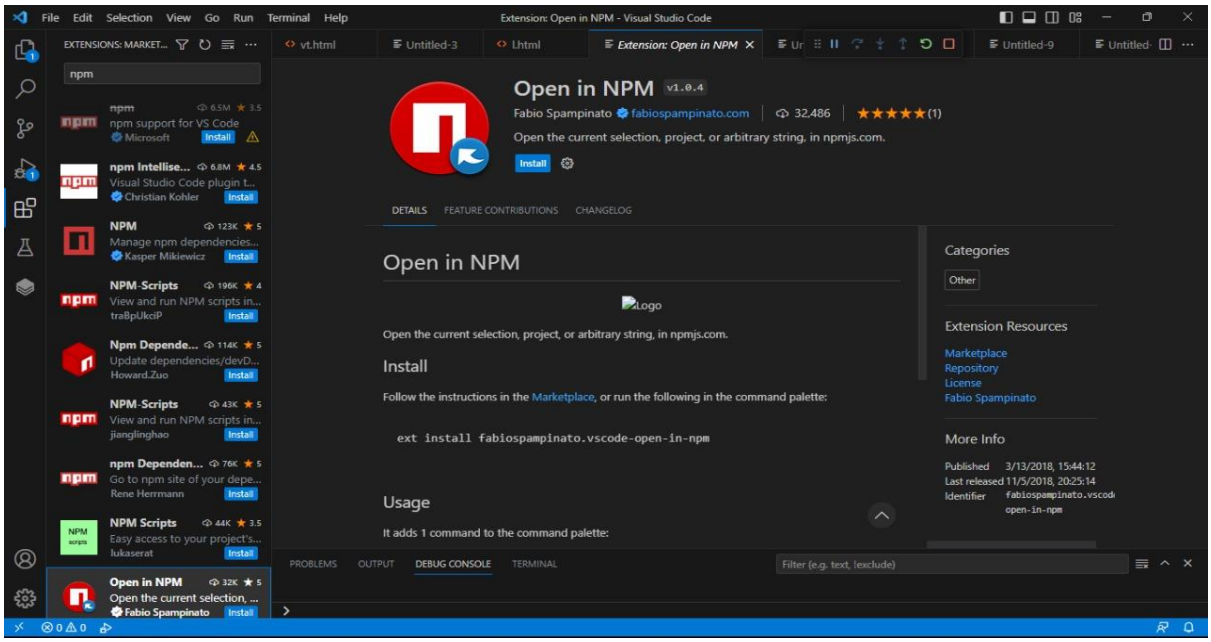
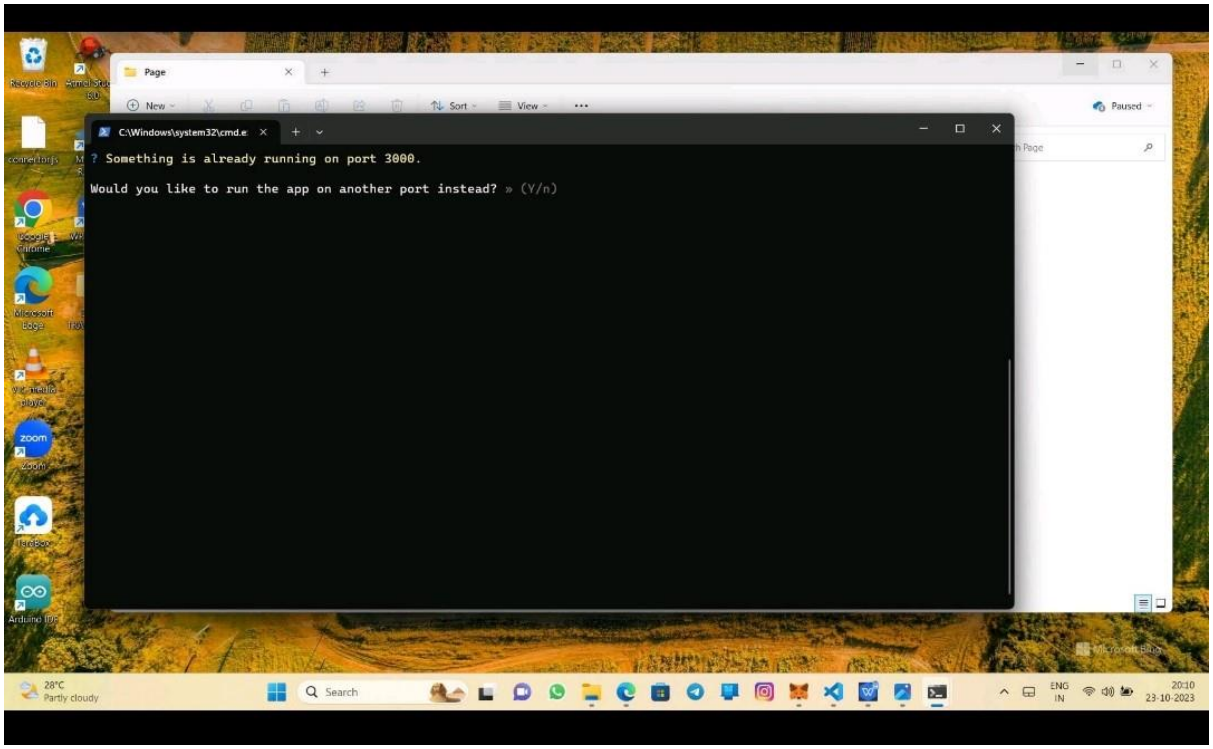


STEP 2 : paste the new contract address





STEP 3 : npm install



STEP 4 : OUTPUT