What is a smart contract? How are they deployed?

So what are contracts, contracts are terms of agreement made for two or more parties. Now talking about smart contracts, they are digital self executing terms (when pre defined terms are met) of agreement written into code. These kinds of contracts are stored, created and built via blockchain. The blockchain platforms mostly include Ethereum. Deploying a smart contract requires interaction with a blockchain network such as Ethereum. These contracts are deployed in the following steps:

1. Programmers write the smart code with predefined terms in programming language such as Solidity.
2. The written code is then compiled in IDE's such as remix
3. By using a wallet we then connect to the blockchain. After this a deployment script is executed and a transaction is sent which includes the compiled Solidity code.
4. Once a transaction is mined the smart contract is finally deployed

What is gas? Why is gas optimization such a big focus when building smart contracts?

Just like other systems used to measure the values of certain physical quantities in Physics, gas is a unit of measurement in the blockchain world which is used to measure the computational power required to execute the code/operation. Gas optimization is such a big focus due to the following reasons:

- As gas fees are paid in Ether, using high gas consumption will result in higher costs.
- If there is high gas consumption by multiple networks then the network might be congested which will lead to slower transactions.
- If used efficiently gas will help to allow for more transactions to be processed.

What is a hash? Why do people use hashing to hide information?

In the computer world, hash function is a method to encrypt the text to a fixed string of certain bytes. A hash is the output generated by the hash function. For example I enter a “Hello world” into a hash function hashFunction(input) then this hash function will return an output such as “2jadlsvnall9nfadfna;-x”. People use hashing to hide information due to various reasons. Some of them are listed below:

- Hashes can verify data integrity by comparing the hash of the original data with the hash of the received data. If they match, the data is genuine.
- Hashing can securely store sensitive information. As hash encrypts the data, data such as password pins etc can easily be stored.
- Hashes provide a quick way to compare large amounts of data. As systems compare the hash values rather than the data itself, the comparison is faster and requires less memory.

How would you prove to a colorblind person that two different coloured objects are actually of different colours?

I would prove to the colour blind person in the following steps

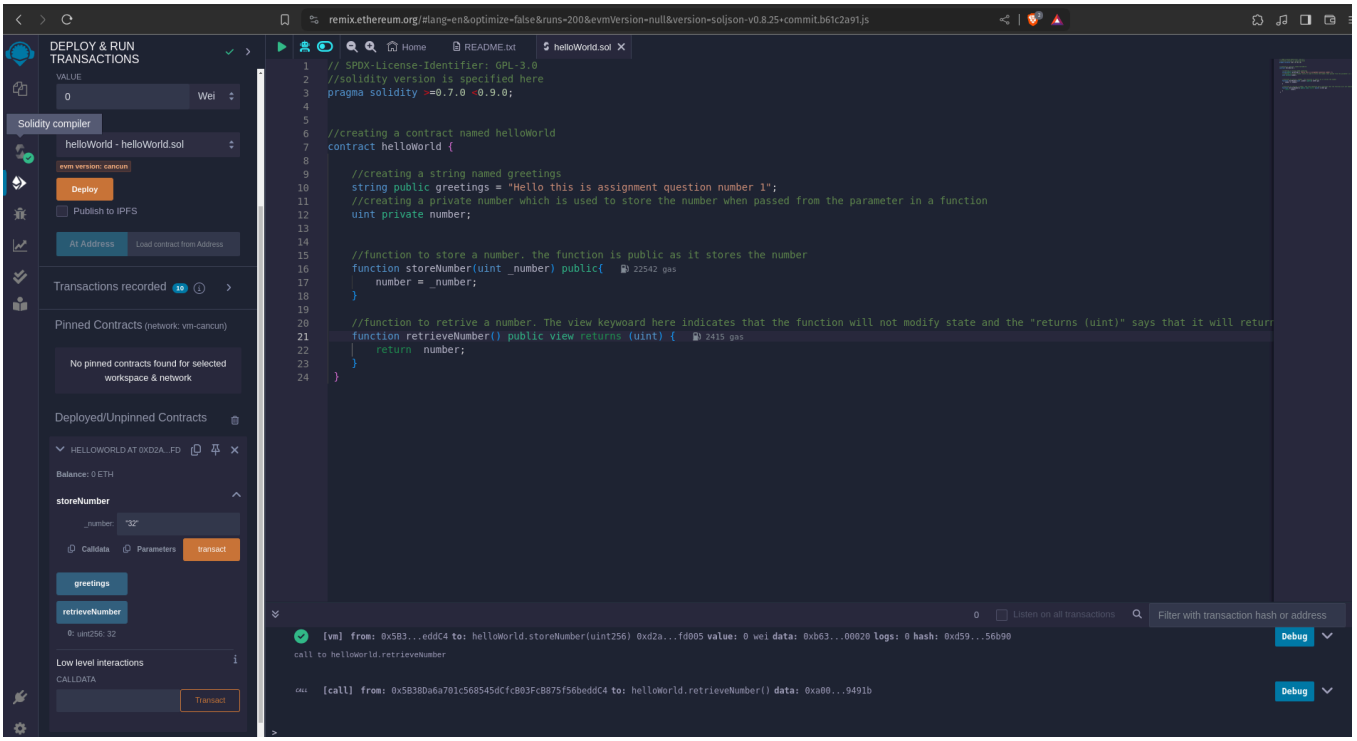
Step 1: Firstly I would ask the colorblind person to randomly shuffle the two Objects (Objects A and Object B) randomly. To insure more difficulty I would look in the opposite direction.

Step 2: When I have to distinguish the objects, I can easily identify the two Objects by their colour.

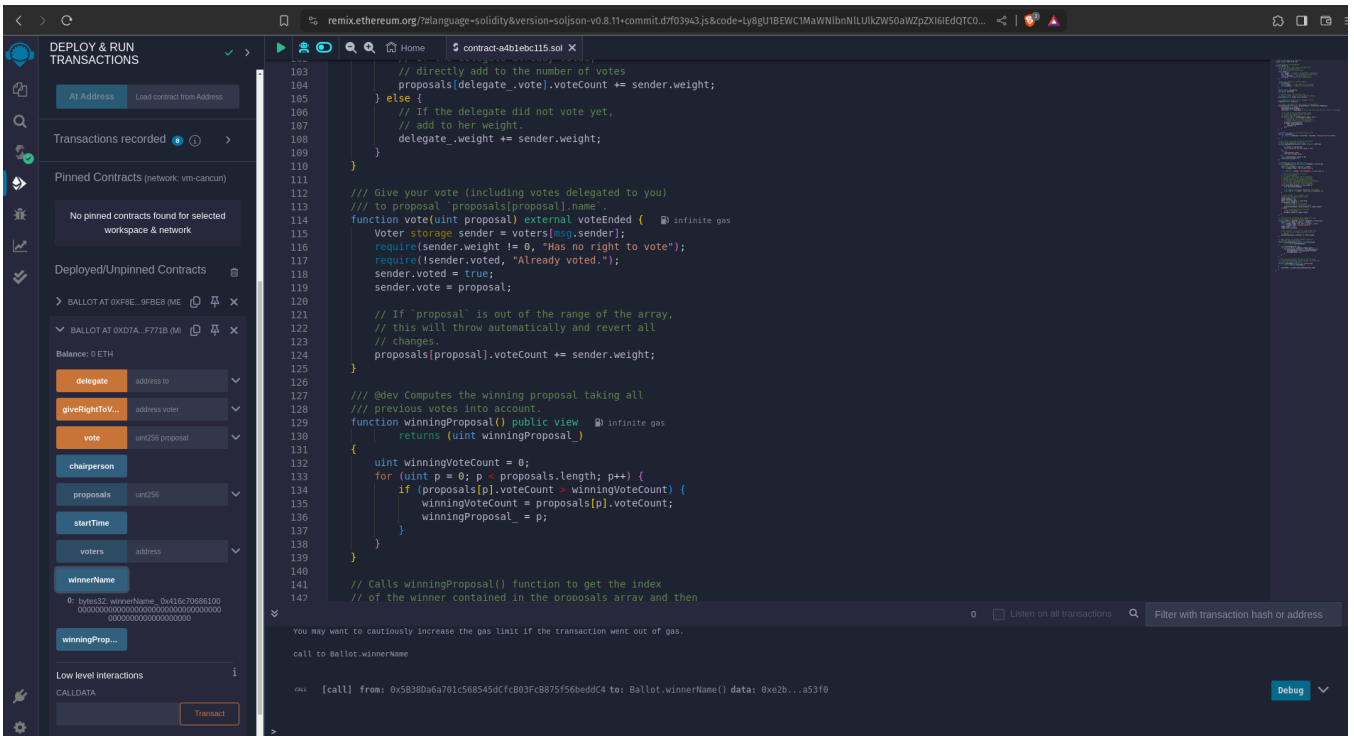
Step 3: Repeat the above two steps multiple times to ensure that I am consistent to the colour blind person.

By following the above steps I can prove to a colorblind person that two different coloured objects are actually of different colours

Question 1 of Solidity exercise



Question 4 of Solidity exercise



Github Link: [Sachyamdh]