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Objective: create a smart contract to track universities properly registered by the ministry of education on the blockchain and test it on a local ganache network.

Tools used: Solidity, Ganache, Remix IDE.

DESCRIPTION

It is becoming increasingly difficult to locate illegal universities that offer education services, with this program you can verify that the university where you enroll is properly registered as an institution in your country.

Background of the problem statement:

In many countries around the world, there are illegal universities that are not affiliated with any government educational institution. Many students enroll in these universities unknowingly and, in turn, end up without jobs or the universities are closed after some time, which ruins their career.

An immutable solution, such as Blockchain, is needed where all the faculties of a university are registered as blockchain to ensure that no one can modify any old registration. That same solution should make it possible to ban any university from registering new students in case there is any complaint against that university. Subsequently, the ban would be removed once the university resolved all complaints.

WHAT I WOULD CHANGE?

I would change to the smart contract, the feature that when registering each student, the student provides his unique ETH address to have an identity instead of his name(string), adding it to a mapping of address => students and inside the Student structure add the address and leave the string, example:

From this:

To this:

```
struct Student{
address sAddress;
string sName;
uint phoneNo;
string courseEnrolled;

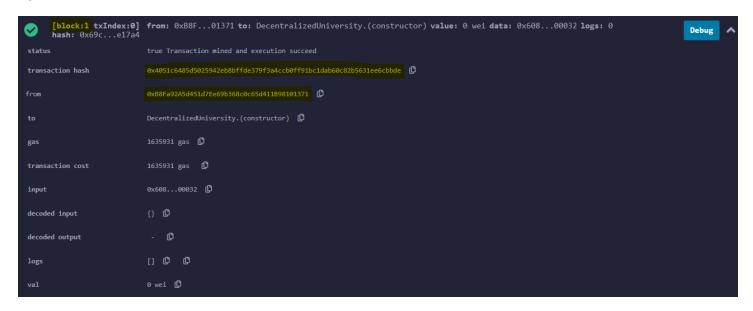
mapping (address => College) colleges; // Mapping a college's address to college
mapping (address => Student) students; // Mapping a student's address to student
```

1. Smart contract deployment

Admin Address (Minister of education): 0xB8Fa92A5d451d7Ee69b368c0c65d411B98101371

Contract address: 0xfE924377877927DecDe4a97679a823e899f41Cd5

Remix IDE

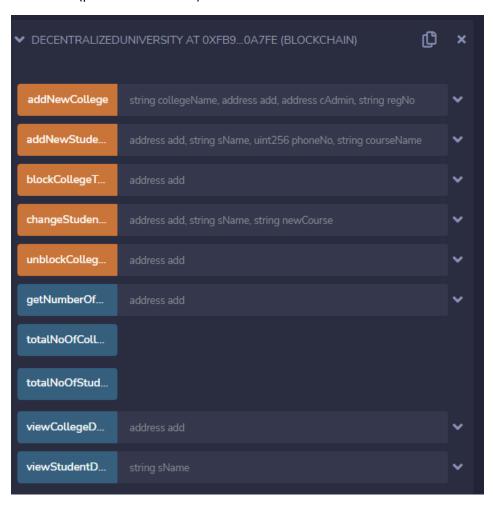


Ganache / TX Hash: 0x4051c6485d5025942eb8bffde379f3a4ccb0ff91bc1dab60c82b5631ee6cbbde



2. Functions

We have 5 functions that can register new data on the blockchain and 5 functions that only call data from the blockchain (public view returns).



3.1 Adding 2 new colleges

- 3.1.1 Simplilearn university address: 0x3F74280c7f45f443Ed6e5b8470d4aBa85BB50BcD
- 3.1.2 Simplilearn university cAdmin address: 0x47ee903Ad17Aaa8AA0620C6305432F8bbA176E71



TX Hash: 0x036334861417149bfb631ce1a90f1706fd2f6e16757d5cfb5a33aca71eff01cb



3.1.3 ETH University address: 0xfA8DC2a9aAb9FB50b51809C62C2009237cA04996

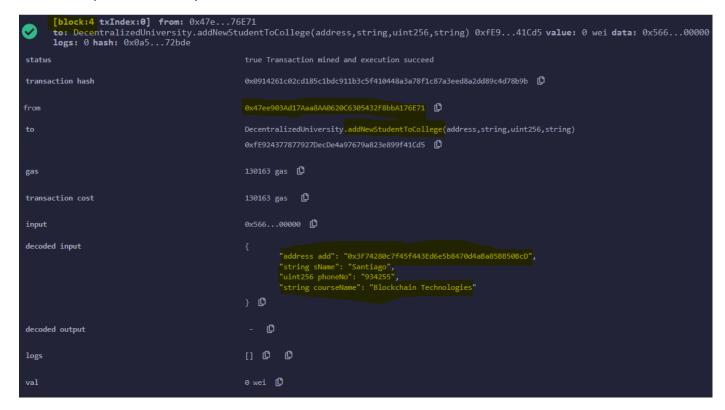
3.1.4 ETH university cAdmin address: 0x5c49325463d1f1F68791b820b9a6148eEa76EE77

TX Hash: 0xaed846c5f8a2e999f58d90e48e5980effc717851be6aa9c0cc85807575884468

TX HASH 0×aed846c5f8a2e999f58d90e48e5980effc717851be6aa9c0cc85807575884468				
FROM ADDRESS	TO CONTRACT ADDRESS	GAS USED	VALUE	
0×B8Fa92A5d451d7Ee69b368c0c65d411B98101371	0×fE924377877927DecDe4a97679a823e899f41Cd5	138575	0	

4. Adding students to colleges

- 4.1 Adding student "Santiago" to Simplilearn university
 - -Simplilearn university address: 0x3F74280c7f45f443Ed6e5b8470d4aBa85BB50BcD
 - -Simplilearn university cAdmin address: 0x47ee903Ad17Aaa8AA0620C6305432F8bbA176E71



TX HASH: 0x0914261c02cd185c1bdc911b3c5f410448a3a78f1c87a3eed8a2dd89c4d78b9b

тх наsн 0×0914261c02cd185c1bdc911b3c5f410448a3a78f1c87a3eed8a2dd89c4d78b9b				CONTRACT CALL
FROM ADDRESS 0×47ee903Ad17Aaa8AA0620C6305432F8bbA176E71	TO CONTRACT ADDRESS 0×fE924377877927DecDe4a97679a823e899f41Cd5	GAS USED 130163	VALUE 0	

4.2 Adding student "Juan" to ETH University

ETH University address: 0xfA8DC2a9aAb9FB50b51809C62C2009237cA04996

ETH university cAdmin address: 0x5c49325463d1f1F68791b820b9a6148eEa76EE77

```
[block:5 txIndex:0] from: 0x5c4...6EE77
to: DecentralizedUniversity.addNewStudentToCollege(address,string,uint256,string) 0xfE9...41Cd5 value: 0 wei data: 0x566...00
       logs: 0 hash: 0x9c3...ea8ba
                                                        true Transaction mined and execution succeed
status
                                                        0x68487866d4d534ae2eb3099d8fe6074d4511bfa6762edc238b129079a9b6b844
transaction hash
                                                        0x5c49325463d1f1F68791b820b9a6148eEa76EE77
                                                        DecentralizedUniversity.addNewStudentToCollege(address,string,uint256,string)
                                                        0xfE924377877927DecDe4a97679a823e899f41Cd5
                                                        114947 gas 🗘
                                                        114947 gas 🚨
transaction cost
                                                        0x566...000000 🗓
input
                                                                 "address add": "0xfA8DC2a9aAb9FB50b51809C62C2009237cA04996",
"string sName": "Juan",
"uint256 phoneNo": "935222",
"string courseName": "Marketing"
                                                        } @
                                                         - @
decoded output
                                                        [] 🗗 🗗
logs
                                                        0 wei 🚨
val
```

TX HASH: 0x68487866d4d534ae2eb3099d8fe6074d4511bfa6762edc238b129079a9b6b844

TX HASH
0×68487866d4d534ae2eb3099d8fe6074d4511bfa6762edc238b129079a9b6b844

FROM ADDRESS
TO CONTRACT ADDRESS
0×5c49325463d1f1F68791b820b9a6148eEa76EE77
0×fE924377877927DecDe4a97679a823e899f41Cd5
0×fE924377877927DecDe4a97679a823e899f41Cd5

- 5.1 Block Simplilearn university from adding new students
 - Admin Address (Minister of education): 0xB8Fa92A5d451d7Ee69b368c0c65d411B98101371
 - -Simplilearn university address: 0x3F74280c7f45f443Ed6e5b8470d4aBa85BB50BcD

[block:6 txIndex:0] from: 0xB8F01371 to: DecentralizedUniversity.blockCollegeToAddNewStudents(address) 0xfE941Cd5 value: 0 wei data: 0xf9350bcd logs: 0 hash: 0x699e8c99						
status	true Transaction mined and execution succeed					
transaction hash	0xd1f90e9540c355fe4741b05ea57a7203e8e958c51ae1a21b61bd1f44451890f9					
from	0x88Fa92A5d451d7Ee69b368c0c65d411898101371					
to	DecentralizedUniversity.blockCollegeToAddNewStudents(address) 0xfE924377877927DecDe4a97679a823e899f41Cd5					
gas	29768 gas 🗘					
transaction cost	14768 gas 🗘					
input	0xf9350bcd					
decoded input	{ "address add": "0x3F74289c7f45f443Ed6e5b8470d4aBa85BB50BcD"					
	} ©					
decoded output	- ©					
logs						
val	0 wei 🗘					

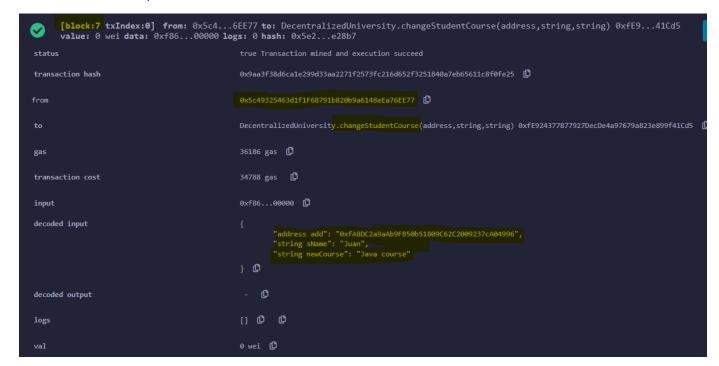
TX HASH: 0xd1f90e9540c355fe4741b05ea57a7203e8e958c51ae1a21b61bd1f44451890f9



6.1 Changing student course Juan, from Marketing to Java course

ETH University address: 0xfA8DC2a9aAb9FB50b51809C62C2009237cA04996

ETH university cAdmin address: 0x5c49325463d1f1F68791b820b9a6148eEa76EE77



TX HASH: 0x9aa3f38d6ca1e299d33aa2271f2573fc216d652f3251840a7eb65611c8f0fe25

тх наsн 0×9aa3f38d6ca1e299d33aa2271f2573fc216d652f3251840a7eb65611c8f0fe25				
FROM ADDRESS	TO CONTRACT ADDRESS	GAS USED	VALUE	
0×5c49325463d1f1F68791b820b9a6148eEa76EE77	0×fE924377877927DecDe4a97679a823e899f41Cd5	34788	0	

- 7.1 Unblocking Simplilearn university from adding new students
 - Admin Address (Minister of education): 0xB8Fa92A5d451d7Ee69b368c0c65d411B98101371
 - -Simplilearn university address: 0x3F74280c7f45f443Ed6e5b8470d4aBa85BB50BcD



TX HASH: 0x4f2c204e83c1256ccd81564f64dd6857c6d1c4c8157c9ecef28699feb3f52112



8.0 Calls FROM RANDOM WALLET: 0xf6EA75e2ecfd6457D7968F4cF757bC6084110021

8.1 Call number of students for Simplilearn university: 0x3F74280c7f45f443Ed6e5b8470d4aBa85BB50BcD

8.2 Call number of students for ETH University: 0xfA8DC2a9aAb9FB50b51809C62C2009237cA04996

8.3 Total number of colleges

8.4 Total number of students



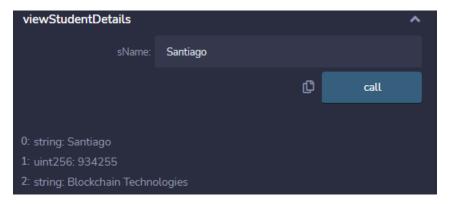
8.5 View college details for Simplilearn University: 0x3F74280c7f45f443Ed6e5b8470d4aBa85BB50BcD (Name, registration number, number of students)



8.6 View college details for ETH university: 0xfA8DC2a9aAb9FB50b51809C62C2009237cA04996 (Name, registration number, number of students)



8.7 View student details for Santiago



8.8 View student details for Juan

