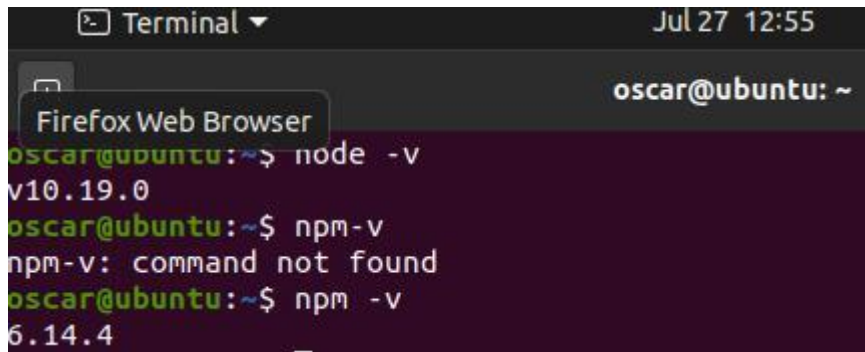


Check the version of node and npm with:

node -v

npm -v

A terminal window titled 'Terminal' with a date and time of 'Jul 27 12:55'. The user 'oscar@ubuntu' is at the prompt '~'. They run 'node -v' which outputs 'v10.19.0'. Then they run 'npm -v' which outputs 'npm-v: command not found'. Finally, they run 'npm -v' which outputs '6.14.4'.

```
oscar@ubuntu:~$ node -v
v10.19.0
oscar@ubuntu:~$ npm -v
npm-v: command not found
oscar@ubuntu:~$ npm -v
6.14.4
```

Use npm to install the Ethereumjs-testrpc with:

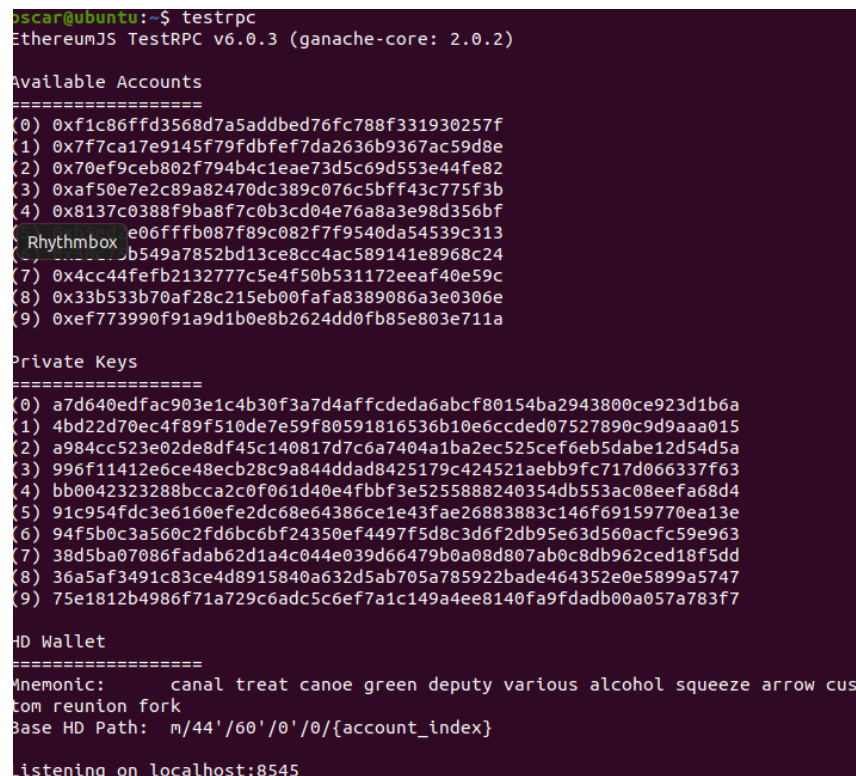
npm install -g ethereumjs-testrpc

A terminal window showing the installation of 'ethereumjs-testrpc' using 'npm install -g'. The command is executed with 'sudo'. The output shows various warnings about deprecated packages and dependencies. The installation completes successfully, adding 368 packages from 292 contributors in 35.233s.

```
oscar@ubuntu:/$ sudo npm install -g ethereumjs-testrpc
[sudo] password for oscar:
npm WARN deprecated ethereumjs-testrpc@6.0.3: ethereumjs-testrpc has been renamed to ganache-cli, please use this package from now on.
npm WARN deprecated querystring@0.2.0: The querystring API is considered Legacy. new code should use the URLSearchParams API instead.
npm WARN deprecated chokidar@2.1.8: Chokidar 2 will break on node v14+. Upgrade to chokidar 3 with 15x less dependencies.
npm WARN deprecated fsevents@1.2.13: fsevents 1 will break on node v14+ and could be using insecure binaries. Upgrade to fsevents 2.
npm WARN deprecated urix@0.1.0: Please see https://github.com/lydell/urix#deprecated
npm WARN deprecated resolve-url@0.2.1: https://github.com/lydell/resolve-url#deprecated
/usr/local/bin/testrpc -> /usr/local/lib/node_modules/ethereumjs-testrpc/build/cli.node.js
> uglifyjs-webpack-plugin@0.4.6 postinstall /usr/local/lib/node_modules/ethereumjs-testrpc/node_modules/uglifyjs-webpack-plugin
> node lib/post_install.js
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@2.3.2 (node_modules/ethereumjs-testrpc/node_modules/chokidar/node_modules/fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@2.3.2: wanted {"os":"darwin","arch":"any"} (current: {"os":"linux","arch":"x64"})
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@1.2.7 (node_modules/ethereumjs-testrpc/node_modules/watchpack-chokidar2/node_modules/chokidar/node_modules/fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.2.7: wanted {"os":"darwin","arch":"any"} (current: {"os":"linux","arch":"x64"})
+ ethereumjs-testrpc@6.0.3
added 368 packages from 292 contributors in 35.233s
```

Start it with:

testrpc

A terminal window showing the output of the 'testrpc' command. It displays the version 'EthereumJS TestRPC v6.0.3 (ganache-core: 2.0.2)' and a list of 10 available accounts with their private keys. It also shows the mnemonic 'canal treat canoe green deputy various alcohol squeeze arrow cus' and the base HD path 'm/44'/60'/0'/0/{account\_index}'. The command is listening on localhost:8545.

```
oscar@ubuntu:~$ testrpc
EthereumJS TestRPC v6.0.3 (ganache-core: 2.0.2)

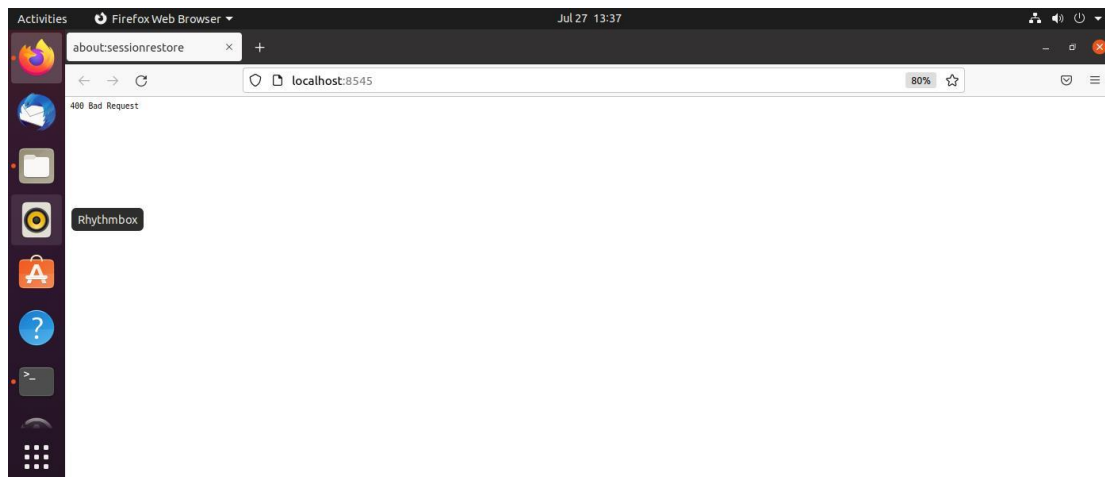
Available Accounts
=====
(0) 0xf1c86fffd3568d7a5addbed76fc788f331930257f
(1) 0x7f7ca17e9145f79fdbef7da2636b9367ac59d8e
(2) 0x70ef9ceb802f794b4c1eae73d5c69d553e44fe82
(3) 0xaf50e7e2c89a82470dc389c076c5bff43c775f3b
(4) 0x8137c0388f9ba8f7c0b3cd04e76a8a3e98d356bf
(5) 0xe0fffb087f89c082f7f9540da54539c313
(6) 0xb549a7852bd13ce8cc4ac589141e8968c24
(7) 0x4cc44fefb2132777c5e4f50b531172eeaf40e59c
(8) 0x33b533b70af28c215eb00fafa8389086a3e0306e
(9) 0xef773990f91a9d1b0e8b2624dd0fb85e803e711a

Private Keys
=====
(0) a7d640edfac903e1c4b30f3a7d4affcdeda6abcf80154ba2943800ce923d1b6a
(1) 4bd22d70ec4f89f510de7e59f80591816536b10e6ccded07527890c9d9aaa015
(2) a984cc523e02de8df45c140817d7c6a7404a1ba2ec525cef6eb5dabe12d54d5a
(3) 996f11412e6ce48ecb28c9a844ddad8425179c424521aebb9fc717d066337f63
(4) bb0042323288bcca2c0f061d40e4fbbf3e5255888240354db553ac08eefa68d4
(5) 91c954fdc3e6160efe2dc68e64386ce1e43fae26883883c146f69159770ea13e
(6) 94f5b0c3a560c2fd6bc6bf24350ef4497f5d8c3d6f2db95e63d560acfc59e963
(7) 38d5ba07086fadab62d1a4c044e039d66479b0a08d807ab0c8db962ced18f5dd
(8) 36a5af3491c83ce4d8915840a632d5ab705a785922bade464352e0e5899a5747
(9) 75e1812b4986f71a729c6adc5c6ef7a1c149a4ee8140fa9fdadb00a057a783f7

HD Wallet
=====
Mnemonic:      canal treat canoe green deputy various alcohol squeeze arrow cus
com reunion fork
Base HD Path:  m/44'/60'/0'/0/{account_index}

Listening on localhost:8545
```

The <http://localhost:5000> look like this:



Create a new folder and go in it

```
oscar@ubuntu:~$ mkdir coursetro-eth
oscar@ubuntu:~$ ls
blockchain-demo  Downloads  Pictures  Templates
coursetro-eth    Ethereum-Wallet-linux64-0-11-1.deb  Public  Videos
desktop         locales    resources
Documents       Music     snap
oscar@ubuntu:~$ cd coursetro-eth
oscar@ubuntu:~/coursetro-eth$
```

Create a package.json file with:

npm init

```
oscar@ubuntu:~/coursetro-eth$ npm init
This utility will walk you through creating a package.json file.
It only covers the most common items, and tries to guess sensible defaults.

See `npm help json` for definitive documentation on these fields
and exactly what they do.

Use `npm install <pkg>` afterwards to install a package and
save it as a dependency in the package.json file.
P
Press ^C at any time to quit.
package name: (coursetro-eth)
version: (1.0.0)
description:
entry point: (index.js)
test command:
git repository:
keywords:
author:
license: (ISC)
About to write to /home/oscar/coursetro-eth/package.json:
{
  "name": "coursetro-eth",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "author": "",
  "license": "ISC"
}

Is this OK? (yes)
oscar@ubuntu:~/coursetro-eth$
```

Install web3.js with:

npm install web3@0.20.6 --save

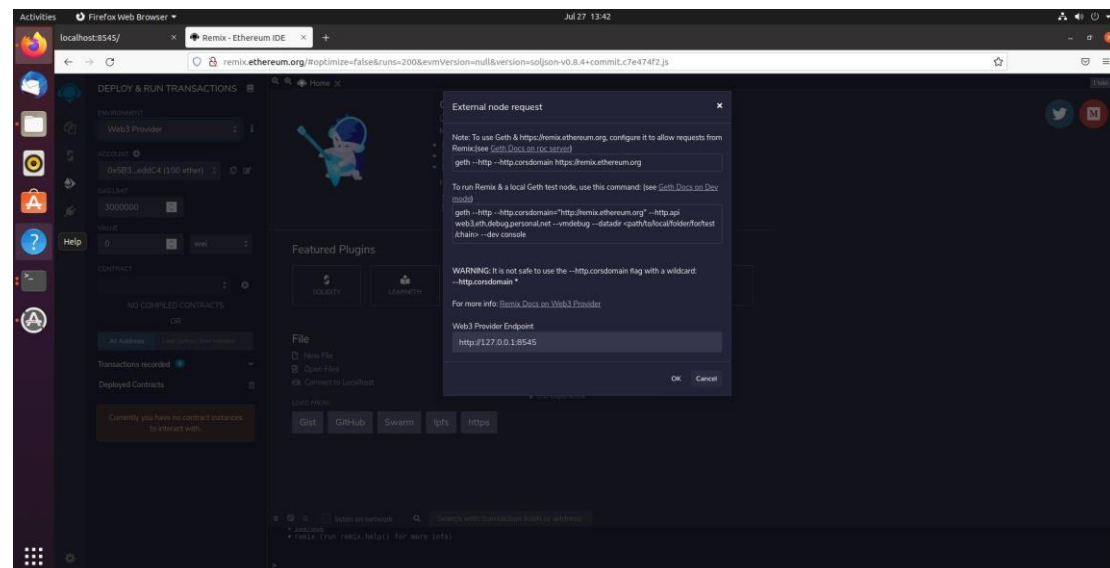
```
oscar@ubuntu:~/coursetro-eth$ npm install ethereum/web3.js --save
npm ERR! Can't install github:ethereum/web3.js#dabe994014cfc328cedbe0922f9e9825553eb111:
Missing package version

npm ERR! A complete log of this run can be found in:
npm ERR! /home/oscar/.npm/_logs/2021-07-27T20_39_54_732Z-debug.log
oscar@ubuntu:~/coursetro-eth$ npm install web3@0.20.6 --save
npm notice created a lockfile as package-lock.json. You should commit this file.
npm WARN coursetro-eth@1.0.0 No description
npm WARN coursetro-eth@1.0.0 No repository field.

+ web3@0.20.6
added 6 packages from 11 contributors and audited 6 packages in 3.356s
found 1 low severity vulnerability
  run `npm audit fix` to fix them, or `npm audit` for details
oscar@ubuntu:~/coursetro-eth$
```

Open the browser, and go to

<http://remix.ethereum.org/#optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.4+commit.c7e474f2.js>



Create a new file named **lab3.sol** with:

pragma solidity ^0.4.18;

contract Coursetro {

string fName;

uint age;

//function Coursetro() public {

constructor() public {

fName= 'Gary';

age = 34;

}

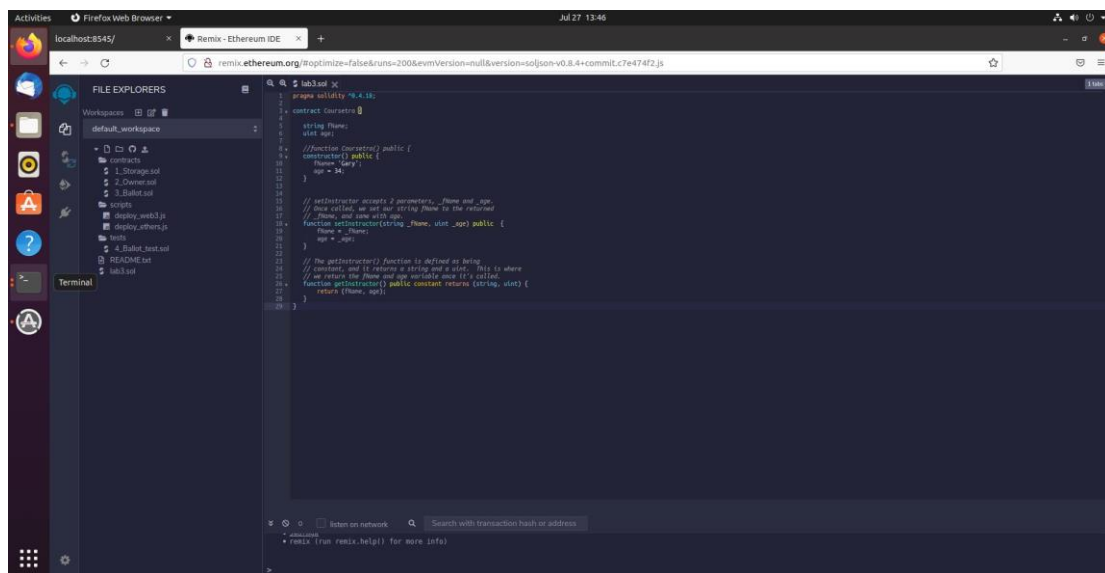
// setInstructor accepts 2 parameters, \_fName and \_age.

```

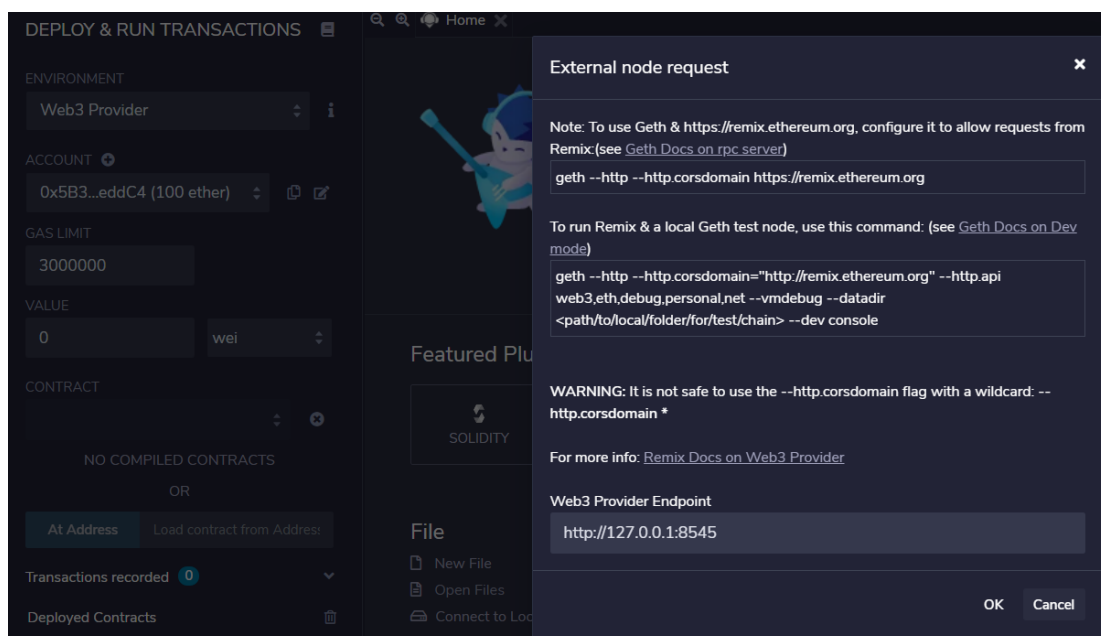
// Once called, we set our string fName to the returned
// _fName, and same with age.
function setInstructor(string _fName, uint _age) public {
    fName = _fName;
    age = _age;
}

// The getInstructor() function is defined as being
// constant, and it returns a string and a uint. This is where
// we return the fName and age variable once it's called.
function getInstructor() public constant returns (string, uint) {
    return (fName, age);
}
}

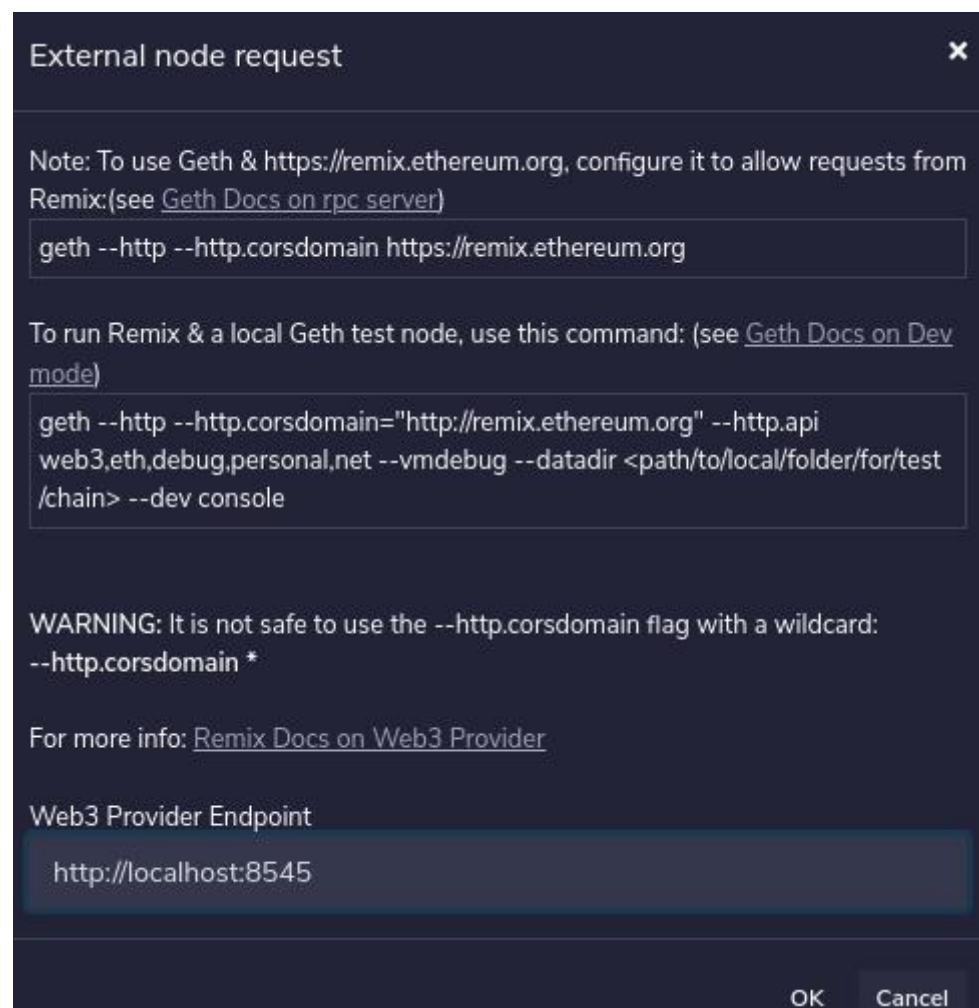
```



Then go to **DEPLOY & RUN TRANSACTIONS**, and change the **ENVIRONMENT** to **Web3 Provider**



Change the Web3 Provider Endpoint to <http://localhost:8545>



Create a .html file and write:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <meta http-equiv="X-UA-Compatible" content="ie=edge">
  <title>Document</title>
  <link rel="stylesheet" type="text/css" href="main.css">
  <script src="./node_modules/web3/dist/web3.min.js"></script>
</head>
<body>
  <div class="container">
    <h1>Coursetro Instructor</h1>
    <h2 id="instructor"></h2>
    <label for="name" class="col-lg-2 control-label">Instructor Name</label>
    <input id="name" type="text">
    <label for="name" class="col-lg-2 control-label">Instructor Age</label>
```



```

        <input id="age" type="text">
        <button id="button">Update Instructor</button>
    </div>
    <script src="https://code.jquery.com/jquery-3.2.1.slim.min.js"></script>
    <script>
        // Our future code here..
    </script>
</body>
</html>

```

```

oscar@ubuntu:~/coursetro-eth$ vi index.html
oscar@ubuntu:~/coursetro-eth$ cat index.html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <meta http-equiv="X-UA-Compatible" content="ie=edge">
  <title>Coursetro Updater</title>
  <link rel="stylesheet" type="text/css" href="main.css">
  <script src="./node_modules/web3/dist/web3.min.js"></script>
</head>
<body>
  <div class="container">
    <h1>Coursetro Instructor</h1>
    <h2 id="instructor"></h2>
    <label for="name" class="col-lg-2 control-label">Instructor Name</label>
    <input id="name" type="text">
    <label for="age" class="col-lg-2 control-label">Instructor Age</label>
    <input id="age" type="text">
    <button id="button">Update Instructor</button>
  </div>
  <script src="https://code.jquery.com/jquery-3.2.1.slim.min.js"></script>
  <script>
    // Our future code here..
  </script>
</body>
</html>

```

Create a .css file to do the layout with:

```

body {
  background-color:#F0F0F0;
  padding: 2em;
  font-family: 'Raleway','Source Sans Pro', 'Arial';
}
.container {
  width: 50%;
  margin: 0 auto;
}
label {
  display:block;
  margin-bottom:10px;
}
input {
  padding:10px;
  width: 50%;
  margin-bottom: 1em;
}

```

```

}
button {
    margin: 2em 0;
    padding: 1em 4em;
    display: block;
}

#instructor {
    padding: 1em;
    background-color: #fff;
    margin: 1em 0;
}

```

```

oscar@ubuntu:~/coursetro-eth$ vi main.css
oscar@ubuntu:~/coursetro-eth$ cat main.css
body {
    background-color: #F0F0F0;
    padding: 2em;
    font-family: 'Raleway', 'Source Sans Pro', 'Arial';
}
.container {
    width: 50%;
    margin: 0 auto;
}
label {
    display: block;
    margin-bottom: 10px;
}
input {
    padding: 10px;
    width: 50%;
    margin-bottom: 1em;
}
button {
    margin: 2em 0;
    padding: 1em 4em;
    display: block;
}

#instructor {
    padding: 1em;
    background-color: #fff;
    margin: 1em 0;
}

```

Add in the .html file with:

```

<script>
if (typeof web3 !== 'undefined') {
    web3 = new Web3(web3.currentProvider);
} else {
    // set the provider you want from Web3.providers
    web3 = new Web3(new Web3.providers.HttpProvider("http://localhost:8545"));
}
</script>

<script>
// Previous if/else statement removed for brevity
web3.eth.defaultAccount = web3.eth.accounts[0];
</script>

```

```
</script>
```

```
// Previous if/else statement removed for brevity
```

```
web3.eth.defaultAccount = web3.eth.accounts[0];
```

```
var CoursetroContract = web3.eth.contract(PASTE ABI HERE!);
```

```
</script>
```

```
<script>
```

```
// Previous if/else statement removed for brevity
```

```
web3.eth.defaultAccount = web3.eth.accounts[0];
```

```
var CoursetroContract = web3.eth.contract(YOUR ABI);
```

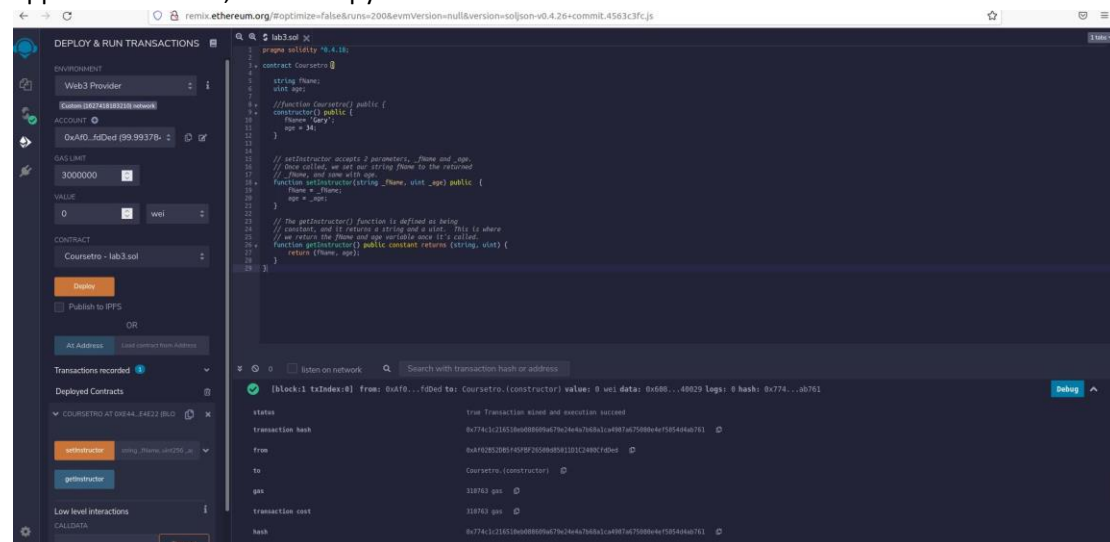
```
var Coursetro = CoursetroContract.at('PASTE CONTRACT ADDRESS HERE');
```

```
console.log(Coursetro);
```

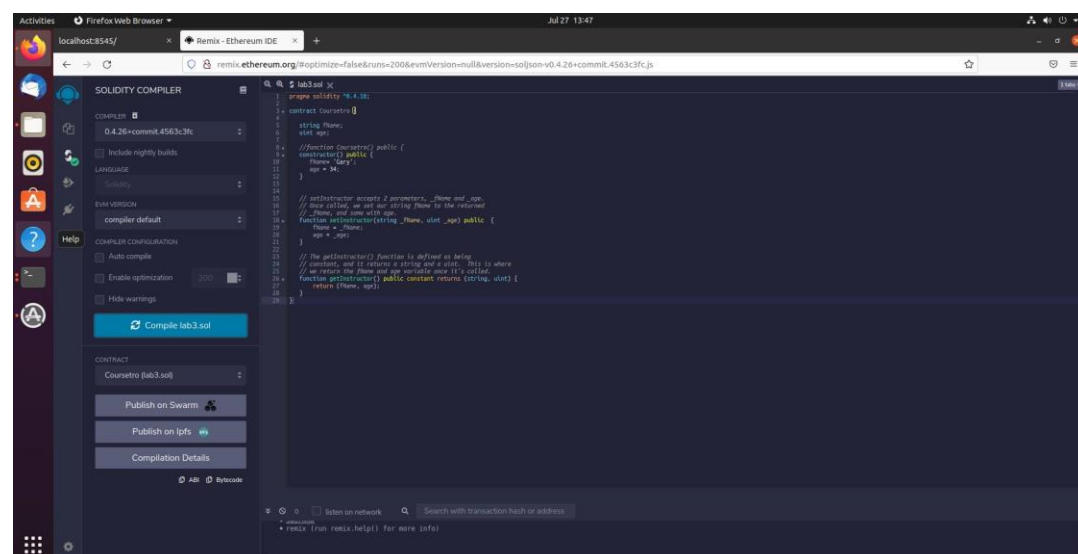
```
</script>
```

Then go to the REMIX page, find our own **address** and **ABI code**

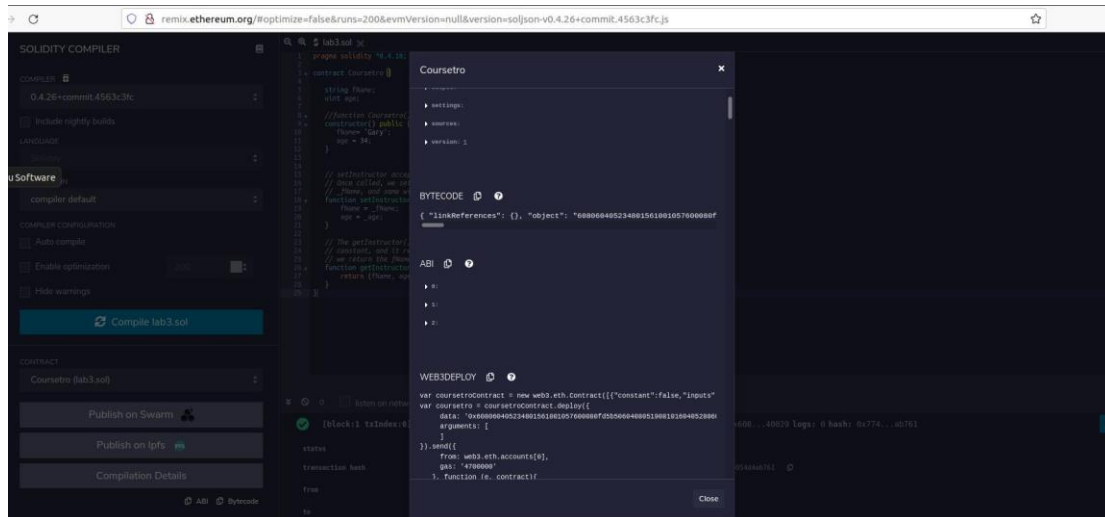
Address is on the DEPLOY & RUN TRANSACTIONS page, after user click the Deploy, there will be appear a new stuff, click to copy address



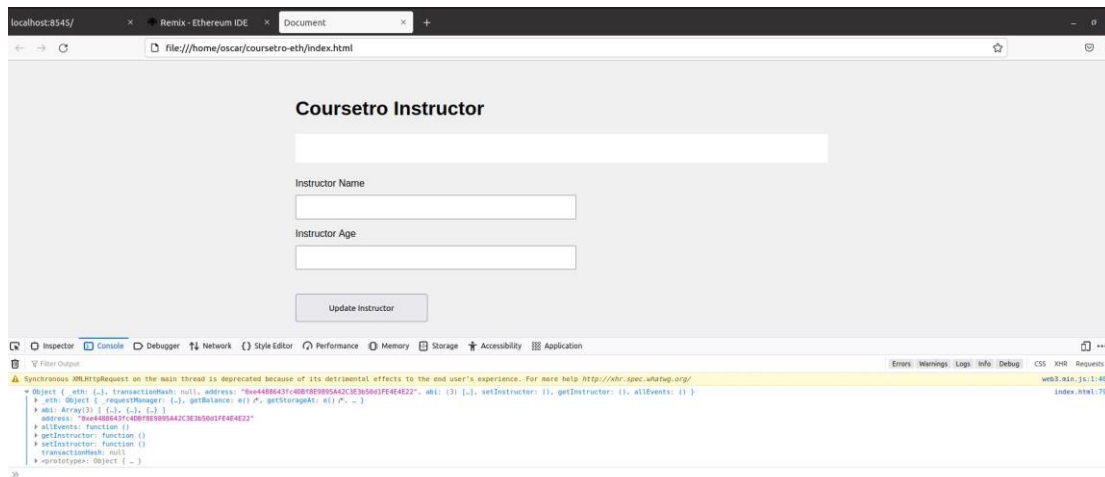
On the SOLIDITY page, we click the Compile then click the compilation Details, we can see there is a part named ABI, we click to copy.







We double click the .html file to open it, and use **CTRL-SHIFT-I (i)** will show the console. You will see something similar to the following:



If working correctly, we should have two functions (**getInstructor** and **setInstructor**) we can type to test with:

**Coursetro.setInstructor('Brutis', 44)**  
**Coursetro.getInstructor()**



Then we use JQuery, and we need add this in .html file:

**<script>**

```
// Previous code removed for brevity
Coursetro.getInstructor(function(error, result){
  if (!error)
  {
    $("#instructor").html(result[0]+' ('+result[1]+' years old)');
    console.log(result);
  }
  else
    console.error(error);
});

$("#button").click(function() {
  Coursetro.setInstructor($("#name").val(), $("#age").val());
});
</script>
```

And the final version of .html file is (replace to your own address and ABI code):

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <meta http-equiv="X-UA-Compatible" content="ie=edge">
  <title>Document</title>
  <link rel="stylesheet" type="text/css" href="main_lab3.css">
  <script src="./node_modules/web3/dist/web3.min.js"></script>
</head>
<body>
  <div class="container">
    <h1>Coursetro Instructor</h1>
    <h2 id="instructor"></h2>
    <label for="name" class="col-lg-2 control-label">Instructor Name</label>
    <input id="name" type="text">
    <label for="age" class="col-lg-2 control-label">Instructor Age</label>
    <input id="age" type="text">
    <button id="button">Update Instructor</button>
  </div>
  <script src="https://code.jquery.com/jquery-3.2.1.slim.min.js"></script>
  <script>
    var web3;
    if (typeof web3 !== 'undefined') {
      web3 = new Web3(web3.currentProvider);
    } else {
      // set the provider you want from Web3.providers
```

```

        web3 = new Web3(new Web3.providers.HttpProvider("http://localhost:8545"));
        if(!web3.isConnected()) {
            console.log('not-connected');
        } else {
            console.log('connected');
        }
    }
}

web3.eth.defaultAccount = web3.eth.accounts[0];
// var CoursetroContract = web3.eth.contract('PASTE ABI CODE HERE');
var CoursetroContract = web3.eth.contract([ { "constant": false, "inputs": [ { "name":
"_ fName"
, "type": "string" }, { "name": "_ age", "type": "uint256" } ]}, {"name": "setInstructor", "outputs":
[], "payable": false, "stateMutability": "nonpayable", "type": "function" }, { "constant": true, "i
nputs": [], "name": "getInstructor", "outputs": [ { "name": "", "type": "string" }, { "name": "", "
type": "uint256" } ]}, {"name": "view", "type": "function" }, { "inputs"
: [], "payable": false, "stateMutability": "nonpayable", "type": "constructor" } ]]);
    console.log('created CoursetroContract');

// Each contact has their own address
// var Coursetro = CoursetroContract.at('PASTE CONTRACT ADDRESS HERE');
console.log('Creating Coursetro');
var Coursetro = CoursetroContract.at('0x87cc9acc8005bdb6e4049b530212cfadbcedc3c7');
console.log(Coursetro);

Coursetro.getInstructor(function(error, result){
    console.log('Inside Coursetro.getInstructor');

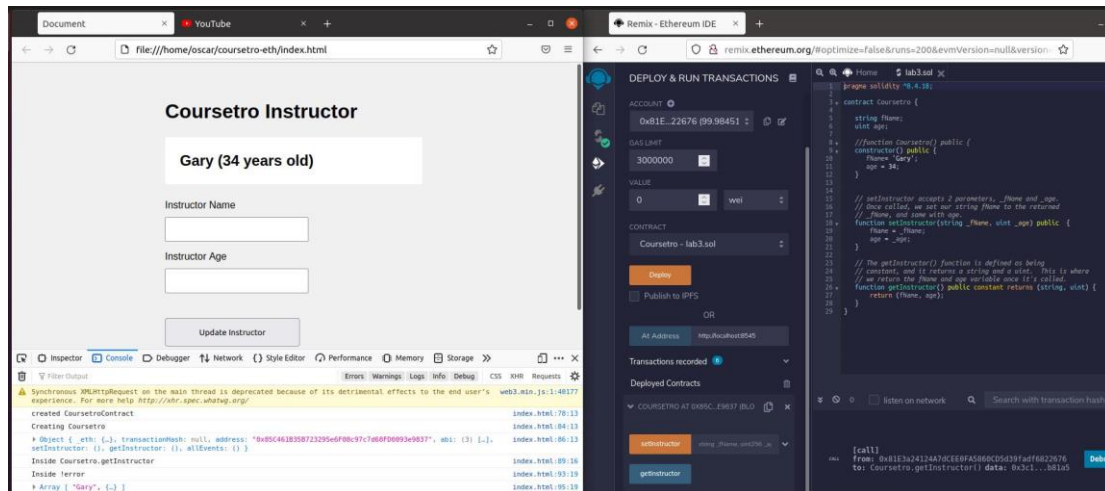
    if (!error)
    {
        console.log('Inside !error');
        $("#instructor").html(result[0]+' ('+result[1]+' years old)');
        console.log(result);
    }
    else
        console.error(error);
});

$("#button").click(function() {
    console.log('Inside click');
    Coursetro.setInstructor($("#name").val(), $("#age").val());
});

```

```
</script>
</body>
</html>
```

Then we go to .html page we should see this:



And also we type in the REMIX page, it will response on our .html file page

