

## TRAVAUX PRATIQUE : Développer, Déployer et Interagir avec un contrat intelligent sur Ethereum

### 1. Prise en main des outils Remix et Metamask

ETH Price: \$1,723.22 (-1.97%) Gas: 24 Gwei

Search by Address / Txn Hash / Block / Token / Domain Name

Etherscan

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Address 0xee36e50aBE1E0babE3F1A617339808b4D9C8AC43 Buy Exchange Gaming

Overview

ETH BALANCE  
0 ETH

ETH VALUE  
\$0.00

More Info

PRIVATE NAME TAGS  
+ Add

NO TXNS SENT FROM THIS ADDRESS

Sponsored

Transactions Token Transfers (ERC-20) Analytics Comments

Transaction Hash Method Block Age From To Value Txn Fee

METAMASK

SUDRIA TESTNET

Account 1  
0xee3...AC43

METAMASK

SUDRIA TESTNET

Account 1  
0xee3...AC43

0.02 ETH  
\$34.56 USD

Acheter Envoyer Swap

Actifs Activité

Site du portefeuille

0.02 ETH  
\$34.56 USD

### f. Détails de la transaction

Address 0xee36e50aBE1E0babE3F1A617339808b4D9C8AC43

Overview

Balance: 0.02 BNB

More Info

My Name Tag: Not Available

Transactions BEP-20 Token Txns

Latest 1 from a total of 1 transactions

Txn Hash	Method	Block	Age	From	To	Value	[Txn Fee]
0x8046ff8989f2b02f99f7...	Transfer	28434207	2 mins ago	0x533fb0469d523dfd5bf...	0xee36e50abe1e0babe3...	0.02 BNB	0.00021

Overview

Transaction Hash:

0x8046fff8989f2b02f99f7db573a0e2f29af025040c20d713e36ca9974220c788

Status:

Success

Block:

28434207

50 Block Confirmations

Timestamp:

2 mins ago (Mar-28-2023 08:50:24 AM +UTC)

From:

0x533fb0469d523dfd5bf3d97e0ad75ea66328d08e

To:

0xee36e50abe1e0babe3f1a617339808b4d9c8ac43

Value:

0.02 BNB (\$0.00)

Transaction Fee:

0.00021 BNB (\$0.07)

Gas Price:

0.00000001 BNB (10 Gwei)

Gas Limit & Usage by Txn:

21,000 | 21,000 (100%)

Other Attributes:

Nonce: 116 | Position: 8

Input Data:

0x

g.Numéro de Block et transaction

Block #28434207

Overview

[ This is a Bsc Testnet block only ]

Block Height:

28434207

< >

Timestamp:

4 mins ago (Mar-28-2023 08:50:24 AM +UTC)

Transactions:

10 transactions and 90 contract internal transactions in this block

Validated by:

0xa2959d3f95eae5dc7d70144ce1b73b403b7eb6e0 in 3 secs

Block Reward:

0.01521131400031968 BNB

Difficulty:

2

Total Difficulty:

56,692,499

Size:

4,716 bytes

Gas Used:

1,541,610 (3.08%)

Gas Limit:



50,000,000

Fee Burnt:


0.001521131400031968 BNB

## h. Génération de notre première transaction Ethereum

## Envoyer


 0x533fB0469D523dfD5BF3D97e0Ad75ea66328D08E 

Actif:


 **ETH**  
Solde: 0.02 ETH


Montant:


0.01 ETH  
\$17.29 USD





Max.

Prix du gaz (GWEI) 

10 

Montant maximal des frais de transaction 

21000 

**Carburant** *(estimé)* 


\$0.36 **0.00021 ETH**


Frais maximaux: 0.00021 ETH


Annuler

Suivant


[< Modifier](#)

 Account 1




 0x533...D08E

ENVOI DE ETH

 **0.01**  
\$17.29

MODIFIER

**Frais de carburant estimés**



**\$0.36 0.00021 ETH**

Frais maximaux: 0.00021 ETH

**Total**

**\$17.66 0.01021 ETH**

Montant + frais de carburant **Montant maximal: 0.01021 ETH**

Rejeter

Confirmer

## I. ABI et Byte code du contrat: cf voir les fichiers

## M. Déploiement du smart contract "Election.sol"

Transaction Hash: 0x71417df2cc183a1508ffe414f1b7b1ed6e238808a8876077c718ed3cf52e2fcd

Status: Success

Block: 28434922 12 Block Confirmations

Timestamp: 39 secs ago (Mar-28-2023 09:26:09 AM +UTC)

From: 0xee36e50abe1e0babe3f1a617339808b4d9c8ac43

To: [Contract 0x3c305d0e02cb886d137d1d2b75b3fadc2690b64a Created]

Value: 0 BNB (\$0.00)

Transaction Fee: 0.00548492 BNB (\$1.70)

Gas Price: 0.00000001 BNB (10 Gwei)

Block: 28434922

Adresse publique du smart contract : 0x3C305D0e02Cb886D137d1d2B75B3fADC2690B64a

Contract 0x3C305D0e02Cb886D137d1d2B75B3fADC2690B64a

Contract Overview

Balance: 0 BNB

More Info

My Name Tag: Not Available

Contract Creator: 0xee36e50abe1e0babe3... at txn 0x71417df2cc183a1508ff...

Transactions

Latest 1 from a total of 1 transactions

Txn Hash	Method	Block	Age	From	To	Value	[Txn Fee]
0x71417df2cc183a1508ff...	0x60806040	28434922	4 mins ago	0xee36e50abe1e0babe3...	IN Contract Creation	0 BNB	0.00548492

[Download CSV Export]


Justification des frais: La puissance de calcul demandée n'est pas la même, donc les frais de transaction sont différents.

N. Ajout du premier candidat

### Deployed Contracts

▼

ELECTION AT 0X3C3...0B64A (BLOK)



×

Balance: 0 ETH

addCandidate

gau

▼

transferOwner

address newOwner

▼

vote

uint256 \_candidateId

▼

candidates

uint256

▼

candidatesCount


owner

voters

address

▼


#### Low level interactions





CALLDATA

Transact

## O.Génération de la transaction


 Account 1



 0x3C3...B64a

https://remix.ethereum.org

0x3C3...B64a : INTERACTION AVEC UN CONTRAT ⓘ



\$0.00

DÉTAILS DONNÉES HEX

MODIFIER

**Frais de carburant estimés** ⓘ **\$1.52 0.00088 ETH**

Site suggéré **Frais maximaux: 0.00088023 ETH**

**Total** **\$1.52 0.00088023 ETH**

Montant + frais de carburant **Montant maximal: 0.00088023 ETH**

✓ [block:28435108 txIndex:2] from: 0xee3...8AC43 to: Election.addCandidate(string) 0x3C3...0B64a value: 0 wei data: 0x462...0000 logs: 0 hash: 0xb28...bcce7

status

true Transaction mined and execution succeed

transaction hash

0x2f1d7df791fae47ea27891927b03679989171a7ce2873cf640478c25c34a524a ⓘ

from

0xee36e50aBE1E0babE3F1A617339808b4D9C8AC43 ⓘ

to

Election.addCandidate(string) 0x3C305D0e02Cb886D137d1d2875B3fADC2690864a ⓘ

gas

88023 gas ⓘ

transaction cost

86540 gas ⓘ

input

0x462...0000 ⓘ

decoded input

{  
 "string\_name": "gau"  
}

 ⓘ

p.Consultation du “CandidateID”

addCandidate	gau	▼
transferOwner	address newOwner	▼
vote	uint256 _candidateId	▼
candidates	1	▼
0: uint256: id 1 1: string: name gau 2: uint256: voteCount 0		
candidatesCount		
0: uint256: 1		
owner		



## q. Ajout du second candidat

Transaction Hash: 0xe77ed77ebe16e20c920ff742941ddf10f8f87778b589a56d0a4f9d8c8da2f2f7 [🔗](#)

Status: Success

Block: 28435436 13 Block Confirmations

Timestamp: 39 secs ago (Mar-28-2023 09:51:51 AM +UTC)

From: 0xee36e50abe1e0babe3f1a617339808b4d9c8ac43 [🔗](#)

To: Contract 0x3c305d0e02cb886d137d1d2b75b3fadc2690b64a ✓ [🔗](#)

Value: 0 BNB (\$0.00)

Transaction Fee: 0.00071564 BNB (\$0.22)

Gas Price: 0.00000001 BNB (10 Gwei)

Gas Limit & Usage by Txn: 73,047 | 71,564 (97.97%)

Other Attributes: Nonce: 3 Position: 7

Input Data:

```
Function: addCandidate(string newCandidate) ***  
  
MethodID: 0x462e91ec  
[0]: 0000000000000000000000000000000000000000000000000000000000000020  
[1]: 0000000000000000000000000000000000000000000000000000000000000005  
[2]: 6f7a63616e00000000000000000000000000000000000000000000000000000000
```

[View Input As](#) [Decode Input Data](#)

## r. Consultation de la valeur du second CandidateID

**addCandidate** ozcan [▼](#)

**transferOwner** address newOwner [▼](#)

**vote** uint256 \_candidateId [▼](#)

**candidates** 2 [▼](#)


0: uint256: id 2  
1: string: name ozcan  
2: uint256: voteCount 0

**candidatesCount**

0: uint256: 2

s. L'adresse du propriétaire du contract: 0xee36e50abe1e0babe3f1a617339808b4d9c8ac43

t. Réalisation du premier vote

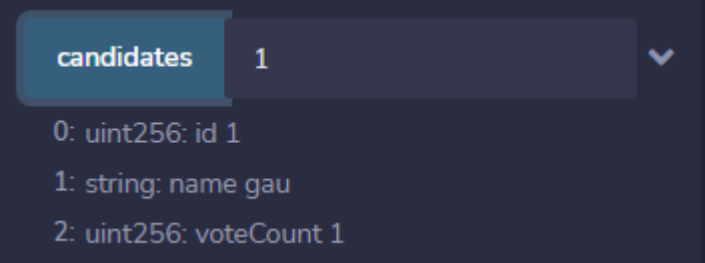


The screenshot shows a transaction interface with a dark theme. At the top, there is a button labeled 'vote' in orange and a dropdown menu showing the number '1'. Below this, there is a tabbed interface with 'Overview' selected and 'Logs (1)' next to it. The transaction details are listed as follows:

- Transaction Hash: 0x1c589e956f3e09a533186eba403dadd8176d44051e0e40e7293c574f317dfdb
- Status: Success
- Block: 28435556 (4 Block Confirmations)
- Timestamp: 14 secs ago (Mar-28-2023 09:57:51 AM +UTC)
- From: 0xee36e50abe1e0babe3f1a617339808b4d9c8ac43
- To: Contract 0x3c305d0e02cb886d137d1d2b75b3fadc2690b64a
- Value: 0 BNB (\$0.00)
- Transaction Fee: 0.00066241 BNB (\$0.20)
- Gas Price: 0.00000001 BNB (10 Gwei)
- Gas Limit & Usage by Txn: 66,241 | 66,241 (100%)
- Other Attributes: Nonce: 4, Position: 8
- Input Data: Function: vote(uint256 \_ein) \*\*\*  
MethodID: 0xb121b93f  
[0]: 0000000000000000000000000000000000000000000000000000000000000001

At the bottom, there are buttons for 'View Input As' and 'Decode Input Data'.

u. Vérification du vote



The screenshot shows a transaction interface with a dark theme. At the top, there is a button labeled 'candidates' in blue and a dropdown menu showing the number '1'. Below this, there is a list of data points:

- 0: uint256: id 1
- 1: string: name gau
- 2: uint256: voteCount 1

v.

Mon contrat: 0x3C305D0e02Cb886D137d1d2B75B3fADC2690B64a

The screenshot shows a web browser window with multiple tabs. The active tab is 'Binance Transaction Hash' with the URL <https://testnet.bscscan.com/tx/0xb20d12c1bd6de44259d5756b6ad9f10faad8af2bd9aa54e51d6aca53c34021f>. The page title is 'Transaction Details'. Below the title, there are tabs for 'Overview' and 'Logs (1)'. A red warning message states: '[ This is a Bsc Testnet transaction only ]'. The transaction details are as follows:

Transaction Hash:	0xb20d12c1bd6de44259d5756b6ad9f10faad8af2bd9aa54e51d6aca53c34021f
Status:	Success
Block:	28435864 37 Block Confirmations
Timestamp:	1 min ago (Mar-28-2023 10:13:15 AM +UTC)
From:	0xa0e31ae8c7dd1cd5230451fc83486fec432d12ec
To:	Contract 0x3c305d0e02cb886d137d1d2b75b3fadc2690b64a
Value:	0 BNB (\$0.00)
Transaction Fee:	0.00051241 BNB (\$0.16)
Gas Price:	0.00000001 BNB (10 Gwei)

At the bottom of the transaction details, there is a link: 'Click to see More'.

```
0: uint256: id 1
1: string: name gau
2: uint256: voteCount 2
```

w.Réalisation du transfert

Contrat Antoine Lelong: 0x7D6D63C232b26b2E5919D8A098571C1e88b7C715

The screenshot shows a web application interface for an election. The title is 'ELECTION AT 0X3C3...0B64A (BLOCKCHAIN)'. The balance is '0 ETH'. There are four buttons: 'addCandidate', 'transferOwner', 'vote', and 'candidates'. The values for each button are: 'ozcan', '0xA0e31AE8C7Dd1Cd5230451FC83486', '1', and '1' respectively.

[ This is a Bsc **Testnet** transaction only ]

Transaction Hash: [0x5f6c4eea347cdfb972355915179551faa2c62dac0db4462f0d4e7641dfe5f293](#)

② Status: ✔ Success

Block: 28436050 6 Block Confirmations

Timestamp: 20 secs ago (Mar-28-2023 10:22:33 AM +UTC)

From: [0xee36e50abe1e0babe3f1a617339808b4d9c8ac43](#)

🔍 To: Contract 0x3c305d0e02cb886d137d1d2b75b3fadc2690b64a ✓ 📄

② Value: 0 BNB (\$0.00)

② Transaction Fee: 0.00030929 BNB (\$0.10)

Gas Price: 0.00000001 BNB (10 Gwei)

② Gas Limit & Usage by Txn: 30,929 | 30,929 (100%)

Other Attributes: Nonce: 6 Position: 1

② Input Data:


```
Function: transferOwnership(address newOwner) ***
```


MethodID: 0xf2fde38b


[illegible]

**At Address** 0x7d6d63c232b26b2e5919d8a098571c

Transactions recorded **5** ⓘ >

Deployed Contracts 

> ELECTION AT 0X3C3...0B64A (BLOCKCHAIN)  ✕

▼ ELECTION AT 0X7D6...7C715 (BLOCKCHAIN)  ✕

Balance: 0 ETH

**addCandidate** string \_name ▼

**transferOwner** address newOwner ▼

**vote** uint256 \_candidateId ▼

**candidates** uint256 ▼

**candidatesCount**

**owner**

**voters** address ▼

[ This is a Bsc **Testnet** transaction only ]

② Transaction Hash: 0x8e42473f70774e765a7c9db640a0ae5cb290ebab5c665406df671fdc593771bf 

② Status: ✔ Success

Block: 28435813 3 Block Confirmations

Timestamp: 12 secs ago (Mar-28-2023 10:10:42 AM +UTC)

From: [0xee36e50abe1e0babe3f1a617339808b4d9c8ac43](#)

🔗 To: Contract 0x7d6d63c232b26b2e5919d8a098571c1e88b7c715 ✓ 📄

Value: 0 BNB (\$0.00)

Transaction Fee: 0.00051241 BNB (\$0.16)

Gas Price: 0.00000001 BNB (10 Gwei)

② Gas Limit & Usage by Txn: 51,241 | 51,241 (100%)

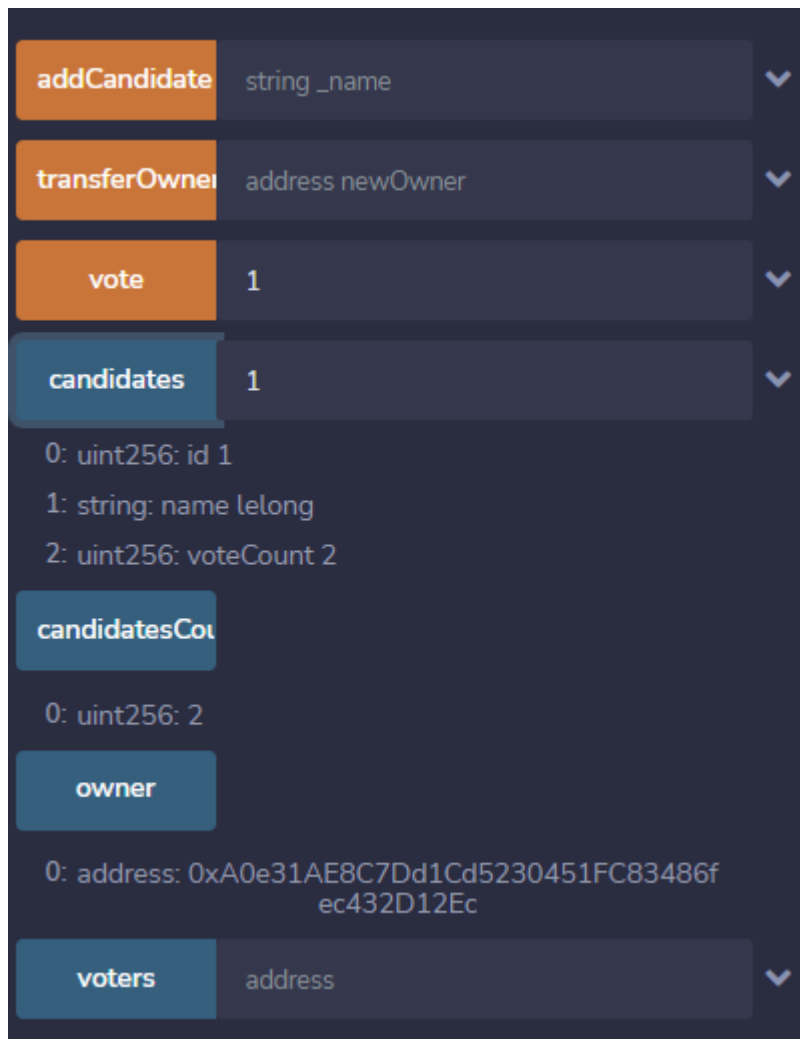
② Other Attributes: Nonce: 5 Position: 9

② Input Data:

```
Function: vote(uint256 _ein) ***
```

MethodID: 0x0121b93f

[illegible]



- x. On peut faire en sorte que l'utilisation soit uniquement réservée au owner du contrat.  
y.

```
/**
 * @dev Throws if called by any account other than the owner.
 */
modifier onlyOwner() {
    require(msg.sender == owner, "Not authorized operation");
    _;
}
```

```
function addCandidate (string memory _name) public onlyOwner{
    candidatesCount ++;
    candidates[candidatesCount] = Candidate(candidatesCount, _name,
0);
}
```