区块链实验报告

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关键代码

我的学号是2012679，前四位2012，后三位678（调整最后一位保证奇偶性相同）。
X + Y = 2012
X - Y = 678
得：X = 1345， Y = 667

scriptSig 提供两个整数x、y，压入栈中。

```
# implement the scriptSig for redeeming the transaction created in Exercise 3a.
txin_scriptSig = [1345, 667]
```

```
# Complete the scriptPubKey implementation for Exercise 3
ex3a_txout_scriptPubKey = [OP_2DUP, OP_ADD, 2012, OP_EQUALVERIFY, OP_SUB, 678, OP_EQUAL]
```

- OP_2DUP
  因为要进行加、减两个运算，所以先使用OP_2DUP将x和y复制一遍
- OP_ADD
  将复制得到的x、y相加
- 2012
  我学号的前四位
- OP_EQUALVERIFY
  判断x + y是否等于2012。如果不等，整个脚本就执行失败，如果相等，会继续执行
- OP_SUB
  计算x - y
- 678
  学号后三位，为了保持奇偶性相同，我将最后一位减1
- OP_EQUAL
  比较x - y是否与678相等，如果相等，则证明x和y是正确的解

控制台输出

ex3a.py的输出

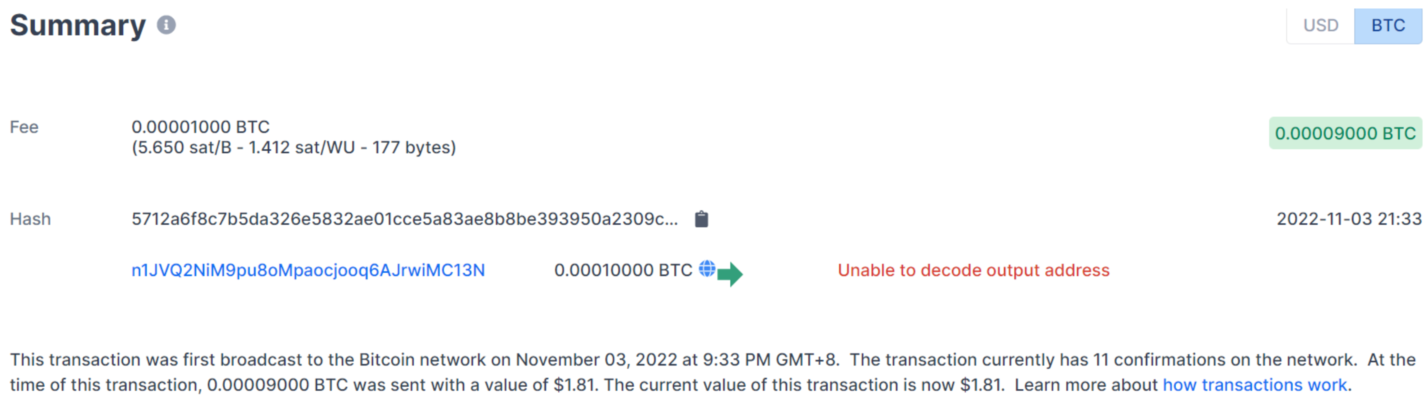
```
201 Created
{
"tx": {
  "block_height": -1,
  "block_index": -1,
  "hash": "5712a6f8c7b5da326e5832ae01cce5a83ae8b8be393950a2309c58b7e77998ba",
  "addresses": [
    "n1JVQ2NiM9pu8oMpaocjooq6AJrwiMC13N"
  ],
  "total": 9000,
  "fees": 1000,
  "size": 177,
  "vsize": 177,
  "preference": "low",
  "relayed_by": "2001:250:401:6562:159e:ed3d:cf84:e76c",
  "received": "2022-11-03T13:33:35.784470756Z",
  "ver": 1,
  "double_spend": false,
  "vin_sz": 1,
  "vout_sz": 1,
  "confirmations": 0,
  "inputs": [
    {
      "prev_hash": "8e087aa8922a1c27e5623f47bffb679e93a83c9044a7771c3fb262769ade8333",
      "output_index": 2,
      "script": "4730440220291bd811e871652c6f1b030ae6512578b82f4425d3a39e224085ae9f9798806d022
      "output_value": 10000,
      "sequence": 4294967295,
      "addresses": [
        "n1JVQ2NiM9pu8oMpaocjooq6AJrwiMC13N"
      ],
      "script_type": "pay-to-pubkey-hash",
      "age": 2350573
    }
  ],
  "outputs": [
    {
      "value": 9000,
      "script": "6e9302dc07889402a60287",
      "addresses": null,
      "script_type": "unknown"
    }
  ]
}
}
```

ex3b.py的输出

```
201 Created
{
"tx": {
  "block_height": -1,
  "block_index": -1,
  "hash": "81555a3189e24198db4b9b6d0e35d18a480e99b12bf5acf7db39641531d7e187",
  "addresses": [
    "mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB"
  ],
  "total": 8000,
  "fees": 1000,
  "size": 91,
  "vsize": 91,
  "preference": "low",
  "relayed_by": "2001:250:401:6562:159e:ed3d:cf84:e76c",
  "received": "2022-11-03T13:42:48.3067036Z",
  "ver": 1,
  "double_spend": false,
  "vin_sz": 1,
  "vout_sz": 1,
  "confirmations": 0,
  "inputs": [
    {
      "prev_hash": "5712a6f8c7b5da326e5832ae01cce5a83ae8b8be393950a2309c58b7e77998ba",
      "output_index": 0,
      "script": "024105029b02",
      "output_value": 9000,
      "sequence": 4294967295,
      "script_type": "unknown",
      "age": 0
    }
  ],
  "outputs": [
    {
      "value": 8000,
      "script": "76a9149f9a7abd600c0caa03983a77c8c3df8e062cb2fa88ac",
      "addresses": [
        "mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB"
      ],
      "script_type": "pay-to-pubkey-hash"
    }
  ]
}
}
```

交易截图

ex3a.py的截图



Summary

USD BTC

Fee 0.00001000 BTC
(5.650 sat/B - 1.412 sat/WU - 177 bytes)

0.00009000 BTC

Hash 5712a6f8c7b5da326e5832ae01cce5a83ae8b8be393950a2309c...

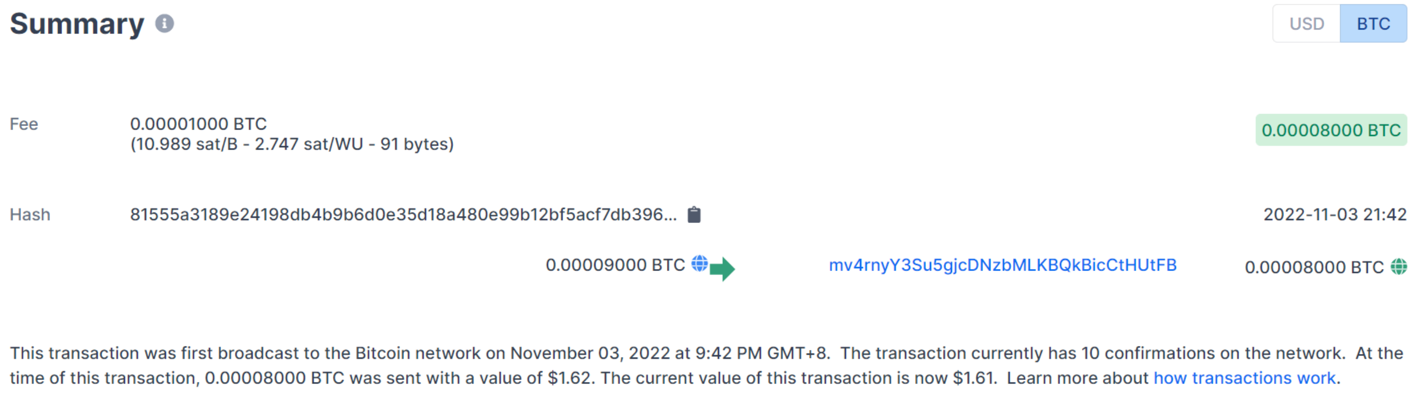
2022-11-03 21:33

n1JVQ2NiM9pu8oMpaocjooq6AJrwiMC13N 0.00010000 BTC

Unable to decode output address

This transaction was first broadcast to the Bitcoin network on November 03, 2022 at 9:33 PM GMT+8. The transaction currently has 11 confirmations on the network. At the time of this transaction, 0.00009000 BTC was sent with a value of $1.81. The current value of this transaction is now $1.81. Learn more about how transactions work.

ex3b.py的截图



Summary

USD BTC

Fee 0.00001000 BTC
(10.989 sat/B - 2.747 sat/WU - 91 bytes)

0.00008000 BTC

Hash 81555a3189e24198db4b9b6d0e35d18a480e99b12bf5acf7db396...

2022-11-03 21:42

0.00009000 BTC

mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB 0.00008000 BTC

This transaction was first broadcast to the Bitcoin network on November 03, 2022 at 9:42 PM GMT+8. The transaction currently has 10 confirmations on the network. At the time of this transaction, 0.00008000 BTC was sent with a value of $1.62. The current value of this transaction is now $1.61. Learn more about how transactions work.