区块链基础及应用实验报告

Ex2

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https://github.com/lxmliu2002/Blockchain_Fundamentals_and_Applications

Ex2a

1. 打开keygen.py文件，创建三个新账户，并将三个账户的私钥填写到ex2a.py文件中。

```
Private key: cTzY6AedUp2ki6yhKnCN5M4pLu7E7NZL44BaxxhxwDSZATueV4sF
Address: mmaRMk3sMBGvAxE1b1nGP94SMK7GqwoaMK
```

```
Private key: cS8mXETAn6PZqM7cLnH7pMHcfLVHuzBoqnaCMXGE1KFVmoT9FYny
Address: mpqNgShTN4GRY9njKnjfeY8GeuZ6vdfDR6
```

```
Private key: cUUKg5w78M22jA5uQyRcoCwMZQKGSpDeQMT4RgBiHEnAvVAGP9Nv
Address: mxKRmngw3sT6ZYGAYLNNybTzd6e5khgnaS
```

```
# 客户私钥
cust1_private_key = CBitcoinSecret('cTzY6AedUp2ki6yhKnCN5M4pLu7E7NZL44BaxxhxwDSZATueV4sF')
cust1_public_key = cust1_private_key.pub
cust2_private_key = CBitcoinSecret('cS8mXETAn6PZqM7cLnH7pMHcfLVHuzBoqnaCMXGE1KFVmoT9FYny')
cust2_public_key = cust2_private_key.pub
cust3_private_key = CBitcoinSecret('cUUKg5w78M22jA5uQyRcoCwMZQKGSpDeQMT4RgBiHEnAvVAGP9Nv')
cust3_public_key = cust3_private_key.pub
```

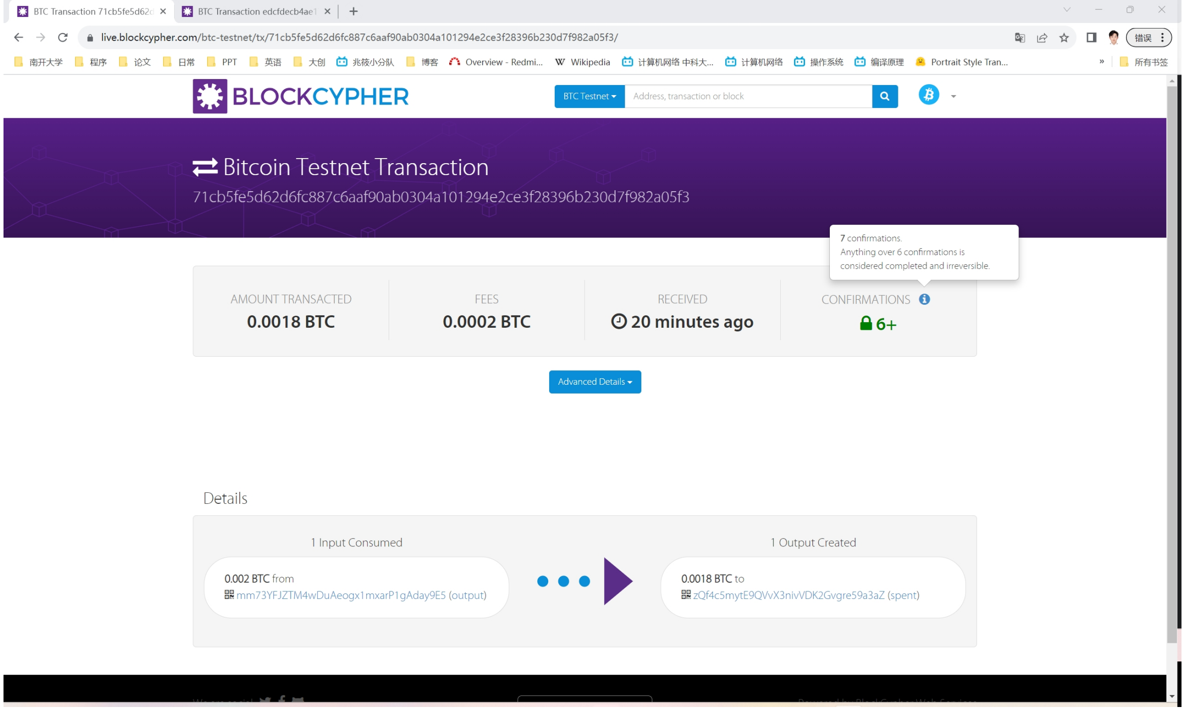
2. 接着补全代码，创建多重签名脚本，完成多签名交易的要求。

```
# 定义所需的签名数量
required_signatures = 3
# 创建包含cust1、cust2和cust3公钥的列表
pubkeys = [cust1_public_key, cust2_public_key, cust3_public_key]
# 创建多重签名脚本
ex2a_txout_scriptPubKey = CScript([required_signatures] + pubkeys + [len(pubkeys), OP_CHECKMULTISIG])
```

3. 填写好要交易的总金额、UTXO交易ID、UTXO索引等信息。

```python
amount_to_send = 0.0018  # amount of BTC in the output you're splitting minus fee
txid_to_spend = ('8b89b2517a25e6694b17c52b2f37d595578911c928a9434aebea79ecbe7d976d')
utxo_index = 8
```

4. 输出信息
   - 由于篇幅所限，输出信息将于附件output_ex2a.txt中展示。
5. faucet截图



Bitcoin Testnet Transaction

71cb5fe5d62d6fc887c6aaf90ab0304a101294e2ce3f28396b230d7f982a05f3

7 confirmations.
Anything over 6 confirmations is considered completed and irreversible.

AMOUNT TRANSACTED	FEES	RECEIVED	CONFIRMATIONS
0.0018 BTC	0.0002 BTC	20 minutes ago	6+

Details

1 Input Consumed

0.002 BTC from
mm73YFJZTM4wDuAeogx1mxarP1gAday9E5 (output)

1 Output Created

0.0018 BTC to
zQf4c5mytE9QVvX3nivVDK2Gvgre59a3aZ (spent)

Ex2b

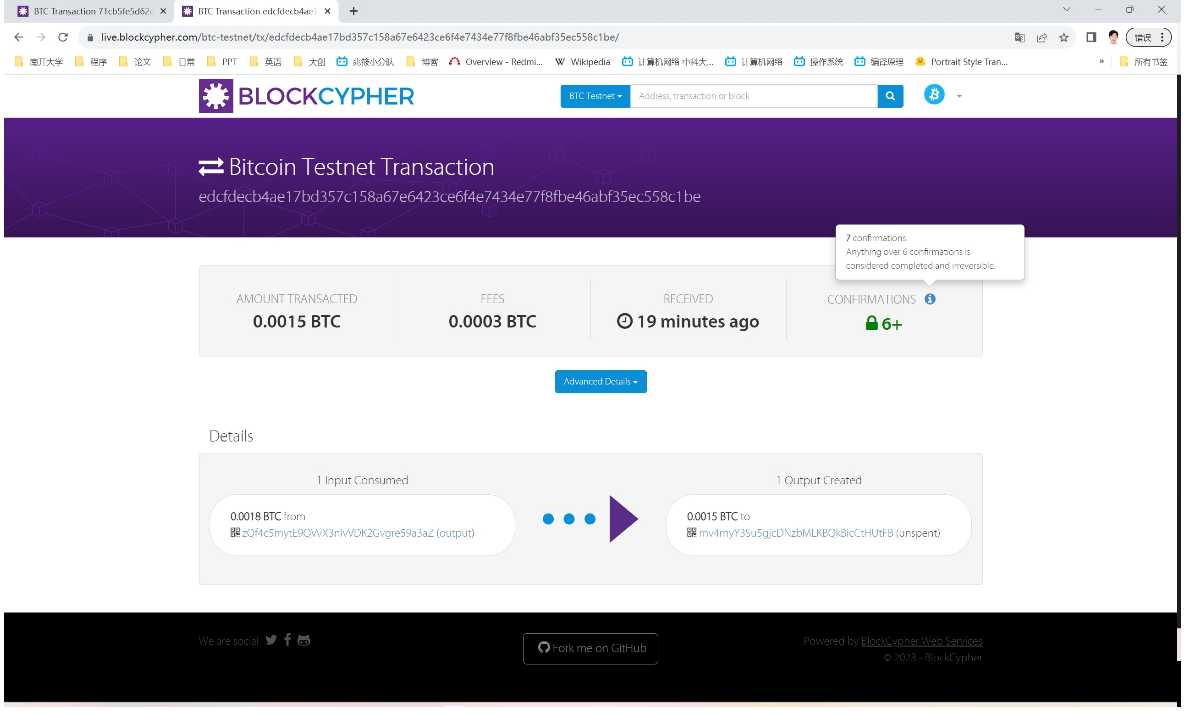
1. 补全多重签名脚本的解锁脚本函数
   - 使用银行私钥(`my_private_key`)和三个客户的私钥（`cust1_private_key`、`cust2_private_key`、`cust3_private_key`）来生成签名。然后，它将这些签名与操作码 `OP_0` 一起返回，以构建多重签名的解锁脚本。

```python
def multisig_scriptSig(txin, txout, txin_scriptPubKey):
    bank_sig = create_OP_CHECKSIG_signature(txin, txout, txin_scriptPubKey, my_private_key)
    cust1_sig = create_OP_CHECKSIG_signature(txin, txout, txin_scriptPubKey, cust1_private_key)
    cust2_sig = create_OP_CHECKSIG_signature(txin, txout, txin_scriptPubKey, cust2_private_key)
    cust3_sig = create_OP_CHECKSIG_signature(txin, txout, txin_scriptPubKey, cust3_private_key)
    return [OP_0, bank_sig, cust1_sig, cust2_sig, cust3_sig]
```

2. 填写好要交易的总金额、UTXO交易ID、UTXO索引等信息。

```python
amount_to_send = 0.0015
txid_to_spend = '71cb5fe5d62d6fc887c6aaf90ab0304a101294e2ce3f28396b230d7f982a05f3'
utxo_index = 0
```

3. 输出信息
    - 由于篇幅所限，输出信息将于附件output_ex2a.txt中展示。
4. faucet截图


BTC Transaction 71cb5fe5d62d
BTC Transaction edcfdecb4ae1
live.blockcypher.com/btc-testnet/tx/edcfdecb4ae17bd357c158a67e6423ce6f4e7434e77f8fbe46abf35ec558c1be/
错误
南开大学
程序
论文
日常
PPT
英语
大创
兆筱小分队
博客
Overview - Redmi...
Wikipedia
计算机网络 中科大...
计算机网络
操作系统
编译原理
Portrait Style Tran...
所有书签
BLOCKCYPHER
BTC Testnet
Address, transaction or block

⇄ Bitcoin Testnet Transaction

edcfdecb4ae17bd357c158a67e6423ce6f4e7434e77f8fbe46abf35ec558c1be

7 confirmations.
Anything over 6 confirmations is considered completed and irreversible.

AMOUNT TRANSACTED	FEES	RECEIVED	CONFIRMATIONS
0.0015 BTC	0.0003 BTC	19 minutes ago	6+

Advanced Details

Details

1 Input Consumed

0.0018 BTC from
zQf4c5mytE9QVvX3nivVDK2Gvgre59a3aZ (output)

1 Output Created

0.0015 BTC to
mv4rnyY3Su5gjcDNzbMLKBQkBicCtHUtFB (unspent)