第七课作业

一. 搭建 Clarity 环境，跑通简单的智能合约并将过程截图

```
root@7064f209eab0:/src/blockstack-core/sample-programs# clarity-cli generate_address
SP24Z0GTPYGZTD7SVRZTVAD4X7T9KS8TQ7YTW4PQX
root@7064f209eab0:/src/blockstack-core/sample-programs# export $DEMO_ADDRESS=SP24Z0GTPYGZTD7SVRZTVAD4X7T9KS8TQ7YTW4PQX
bash: export: `=SP24Z0GTPYGZTD7SVRZTVAD4X7T9KS8TQ7YTW4PQX': not a valid identifier
root@7064f209eab0:/src/blockstack-core/sample-programs# export $DEMO_ADDRESS="SP24Z0GTPYGZTD7SVRZTVAD4X7T9KS8TQ7YTW4PQX"
bash: export: `=SP24Z0GTPYGZTD7SVRZTVAD4X7T9KS8TQ7YTW4PQX': not a valid identifier
root@7064f209eab0:/src/blockstack-core/sample-programs# export DEMO_ADDRESS=SP24Z0GTPYGZTD7SVRZTVAD4X7T9KS8TQ7YTW4PQX
root@7064f209eab0:/src/blockstack-core/sample-programs# clarity-cli initialize /data/db
Database created.
root@7064f209eab0:/src/blockstack-core/sample-programs# ll
bash: ll: command not found
root@7064f209eab0:/src/blockstack-core/sample-programs# ls
names.clar  tokens.clar
root@7064f209eab0:/src/blockstack-core/sample-programs# vim store.clar
root@7064f209eab0:/src/blockstack-core/sample-programs# clarity-cli check store.clar /data/db
Error (line 4, column 1): defining 'value' conflicts with previous value.

root@7064f209eab0:/src/blockstack-core/sample-programs# vim store.clar
root@7064f209eab0:/src/blockstack-core/sample-programs# clarity-cli check names.clar /data/db
Error (line 11, column 1): use of unresolved contract ''S1G2081040G2081040G2081040G208105NK8PE5.tokens'.

root@7064f209eab0:/src/blockstack-core/sample-programs# vim sum.clar
root@7064f209eab0:/src/blockstack-core/sample-programs# clarity-cli check sum.clar /data/db
Checks passed.
root@7064f209eab0:/src/blockstack-core/sample-programs# clarity-cli launch $DEMO_ADDRESS.sum sum.clar /data/db
Contract initialized!
root@7064f209eab0:/src/blockstack-core/sample-programs# clarity-cli execute /data/db $DEMO_ADDRESS.sum sum $DEMO_ADDRESS /data/db u10 u15
Error parsing argument "/data/db"
Caused by: ASTError(ParseError { err: IllegalVariableName("/data/db"), expressions: None, diagnostic: Diagnostic { level: Error, message: "Illeg
al variable name: \'/data/db\'", spans: [], suggestion: None } })
root@7064f209eab0:/src/blockstack-core/sample-programs# clarity-cli execute /data/db $DEMO_ADDRESS.sum sum $DEMO_ADDRESS  u10 u15
Transaction executed and committed. Returned: u25
root@7064f209eab0:/src/blockstack-core/sample-programs#
```

二. 分析 token.clar 代码，将带有注释的 token.clar 代码提交

```
token.clar
(define-map tokens ((account principal)) ((balance uint)))                    ; 定义一个哈希Map:tokens, 其中key为account,类型为principal,value为balance(余额),类型为uint
(define-private (get-balance (account principal))                             ; 定义一个私有函数:get-balance, 参数名为account,类型为principal
  (default-to u0 (get balance (map-get? tokens (tuple (account account))))))  ; 获取token中对应account的balance值,如果account不存在,返回默认值0

(define-private (token-credit! (account principal) (amount uint))             ; 定义私有函数:token-credit,存款token
  (if (<= amount u0)                                                          ; 判断存款金额是否小于等于0
      (err "must move positive balance")                                      ; 返回错误提示:移动金额必须为正
      (let ((current-amount (get-balance account)))                           ; 获取指定account的余额,并赋值给current-account变量
        (begin                                                                ; 执行开始
          (map-set tokens (tuple (account account))                           ; 设置指定account的余额为current-account+amount
                          (tuple (balance (+ amount current-amount))))        ;
          (ok amount)))))                                                     ; 返回结果存款金额

(define-public (token-transfer (to principal) (amount uint))                 ; 定义公共函数: token-transfer(转账),第一参数名to(收款人),类型为principal,第二参数名amount(转账金额),类型为uint
  (let ((balance (get-balance tx-sender)))                                    ; 获取account为tx-sender的余额,并赋值给balance变量
    (if (or (> amount balance) (<= amount u0))                                ; 判断转账金额是否大于余额,或者转账金额小于等于0
        (err "must transfer positive balance and possess funds")              ; 错误提示:必须转账正余额并拥有资金
        (begin                                                                ; 执行开始
          (map-set tokens (tuple (account tx-sender))                         ; 设置account为tx-sender的余额为balance-amount
                          (tuple (balance (- balance amount))))               ;
          (token-credit! to amount)))))                                       ; 为指定的account(to)存款account

(define-public (mint! (amount uint))                                          ; 定义公共函数:mint,参数名amount,类型为uint,!表示方法可能不安全
  (let ((balance (get-balance tx-sender)))                                    ; 获取account为tx-sender的余额,并赋值给balance变量
    (token-credit! tx-sender amount)))                                        ; 为account是tx-sender的账户存款account

(token-credit! 'S2J62Y48GV1E25V2V5RB5MP66SW86PYKKQ9H6DPR u10000)               ; 给account为'S2J62Y48GV1E25V2V5RB5MP66SW86PYKKQ9H6DPR'存款 10000
(token-credit! 'SM2J62Y48GV1E25V2V5RB5MP66SW86PYKKQVX8X0G u300)               ; 给account为'SM2J62Y48GV1E25V2V5RB5MP66SW86PYKKQVX8X0G'存款 300
```

三. 回答思考题，将思考题答案提交

题目一：根据今天对于智能合约的讲解，你认为智能合约可以解决哪些现有互联网无法解决的问题？又会带来哪些问题？

A: 解决互联网多方互不信任的情况下达成信任共识,并自动保证执行合约,并不需要权威机构背书,结果有效.问题是有漏洞容易被攻击,导致损失.

题目二：前六节课的主要内容均为 Blockstack V1 的架构，本节 Blockstack V2 架构中的一个核心内容，请问你认为 V1 与 V2 将如何结合在一起呢？

A: V1 架构主要是去中心化身份体系(DID)及存储,是 Blockstack 的基石,V2 架构给 DID 带来了构建业务生态的能力.

题目三：如果将本节课的内容应用在去中心化留言板中，你认为整个留言板的流程图会有什么变化？会添加哪些功能？（建议画出流程图讲解）

A: 可以实现打赏等功能.