

Task 1 : Create & deploy a smart contract using cargo casper and cargo test

```
Compiling displaydoc v0.1.7
Compiling tracing-attributes v0.1.16
Compiling zeroize v1.4.1
Compiling datasize v0.2.9
Compiling elliptic-curve v0.8.5
Compiling curve25519-dalek v3.2.0
Compiling thiserror v1.0.29
Compiling ecdsa v0.10.2
Compiling k256 v0.7.3
Compiling tracing v0.1.27
Compiling hex v0.4.3
Compiling ed25519 v1.2.0
Compiling serde_bytes v0.11.5
Compiling toml v0.5.8
Compiling bincode v1.3.3
Compiling uuid v0.8.2
Compiling ed25519-dalek v1.0.1
Compiling pwasm-utils v0.16.0
Compiling uint v0.9.1
Compiling hex-buffer-serde v0.2.2
Compiling num v0.4.0
Compiling version-sync v0.9.2
Compiling casper-types v1.3.3
Compiling casper-execution-engine v1.3.3
Compiling casper-contract v1.3.2
Compiling casper-engine-test-support v1.3.2
Finished test [unoptimized + debuginfo] target(s) in 35.64s
Running unittests (target/debug/deps/integration_tests-2f4e97994ecb248b)

running 1 test
test tests::should_store_hello_world ... ok

test result: ok. 1 passed; 0 failed; 0 ignored; 0 measured; 0 filtered out; finished in 0.09s
```

Task 2 : Multi-Signature Tutorial

For the 2 nd i chose Multi-Signature Tutorial .

Successful build of key manager:

```
Compiling rand v0.8.4
Compiling regex v1.5.4
Compiling unicode-normalization v0.1.19
Compiling rand_core v0.5.1
Compiling quote v1.0.9
Compiling uint v0.9.1
Compiling ff v0.8.0
Compiling rand_chacha v0.2.2
Compiling idna v0.2.3
Compiling group v0.8.0
Compiling rand v0.7.3
Compiling digest v0.9.0
Compiling crypto-mac v0.10.1
Compiling block-buffer v0.9.0
Compiling crypto-mac v0.8.0
Compiling url v2.2.2
Compiling signature v1.2.2
Compiling hmac v0.10.1
Compiling sha2 v0.9.8
Compiling blake2 v0.9.2
Compiling synstructure v0.12.5
Compiling serde_derive_internals v0.25.0
Compiling zeroize_derive v1.1.0
Compiling schemars_derive v0.8.3
Compiling thiserror-impl v1.0.29
Compiling datasize_derive v0.2.9
Compiling displaydoc v0.1.7
Compiling num-derive v0.3.3
Compiling zeroize v1.4.1
Compiling datasize v0.2.9
Compiling elliptic-curve v0.8.5
Compiling curve25519-dalek v3.2.0
Compiling thiserror v1.0.29
Compiling ecdsa v0.10.2
Compiling k256 v0.7.3
Compiling ed25519 v1.2.0
Compiling serde_bytes v0.11.5
Compiling toml v0.5.8
Compiling ed25519-dalek v1.0.1
Compiling version-sync v0.9.2
Compiling casper-types v1.3.3
Compiling casper-contract v1.3.2
Compiling keys-manager v0.2.0 (/Users/shriftyy/Personal/Computing/bounties/get_started/multi-sig/keys-manager/contract)
Finished release [optimized] target(s) in 25.74s
```

Set up the local casper Network we use the following commande :

```
$ nctl-compile
$ nctl-assets-setup && nctl-start
$ nctl-view-faucet-account
```

Compilation of NCTL:

▼ nctl	Today at 9:13 pm	--	Folder
activate	Today at 8:37 pm	8 KB	Unix Ex...ble File
▼ assets	Today at 9:13 pm	--	Folder
▼ net-1	Today at 9:13 pm	--	Folder
> bin	Today at 9:13 pm	--	Folder
> chainspec	Today at 9:13 pm	--	Folder
> daemon	Today at 9:13 pm	--	Folder
▼ faucet	Today at 9:13 pm	--	Folder
public_key_hex	Today at 9:13 pm	66 bytes	Document
public_key.pem	Today at 9:13 pm	116 bytes	printabl...archive
secret_key.pem	Today at 9:13 pm	122 bytes	printabl...archive
▼ nodes	Today at 9:13 pm	--	Folder
> node-1	Today at 9:13 pm	--	Folder
> node-2	Today at 9:13 pm	--	Folder
> node-3	Today at 9:13 pm	--	Folder
> node-4	Today at 9:13 pm	--	Folder
> node-5	Today at 9:13 pm	--	Folder
> node-6	Today at 9:13 pm	--	Folder
> node-7	Today at 9:13 pm	--	Folder
> node-8	Today at 9:13 pm	--	Folder
> node-9	Today at 9:13 pm	--	Folder
> node-10	Today at 9:13 pm	--	Folder
> users	Today at 9:13 pm	--	Folder

Initialisation of The node:

```

2021-09-14T22:07:17.6N [INFO] [58860] NCTL :: asset tear-down begins ... please wait
2021-09-14T22:07:17.6N [INFO] [58860] NCTL :: ... deleting files
2021-09-14T22:07:19.6N [INFO] [58860] NCTL :: asset tear-down complete
2021-09-14T22:07:19.6N [INFO] [58860] NCTL :: asset setup begins ... please wait
2021-09-14T22:07:19.6N [INFO] [58860] NCTL :: ... setting directories
2021-09-14T22:07:20.6N [INFO] [58860] NCTL :: ... setting binaries
2021-09-14T22:07:20.6N [INFO] [58860] NCTL :: ... setting cryptographic keys
2021-09-14T22:07:20.6N [INFO] [58860] NCTL :: ... setting daemon config
2021-09-14T22:07:20.6N [INFO] [58860] NCTL :: ... setting chainspec.toml
2021-09-14T22:07:20.6N [INFO] [58860] NCTL :: ... setting accounts.toml
2021-09-14T22:07:20.6N [INFO] [58860] NCTL :: ... setting node configs
2021-09-14T22:07:21.6N [INFO] [58860] NCTL :: asset setup complete
2021-09-14T22:07:21.6N [INFO] [58860] NCTL :: starting node(s) begins ... please wait
2021-09-14T22:07:21.6N [INFO] [58860] NCTL :: ... starting supervisord
2021-09-14T22:07:23.6N [INFO] [58860] NCTL :: ... starting nodes: genesis bootstraps
2021-09-14T22:07:24.6N [INFO] [58860] NCTL :: ... starting nodes: genesis non-bootstraps
2021-09-14T22:07:25.6N [INFO] [58860] NCTL :: starting node(s) complete
validators-1:casper-net-1-node-1    RUNNING    pid 70899, uptime 0:00:03
validators-1:casper-net-1-node-2    RUNNING    pid 70900, uptime 0:00:03
validators-1:casper-net-1-node-3    RUNNING    pid 70901, uptime 0:00:03
validators-2:casper-net-1-node-4    RUNNING    pid 70915, uptime 0:00:02
validators-2:casper-net-1-node-5    RUNNING    pid 70916, uptime 0:00:02
validators-3:casper-net-1-node-10   STOPPED    Not started
validators-3:casper-net-1-node-6    STOPPED    Not started
validators-3:casper-net-1-node-7    STOPPED    Not started
validators-3:casper-net-1-node-8    STOPPED    Not started
validators-3:casper-net-1-node-9    STOPPED    Not started

```

Client testing:

```

Deploy result:

{
  deploy: {
    hash: '05ca0542a55e48e54340a2e90cf6a5cb0e169e3cb7950ce5c405f46f3ae2853e',
    header: {
      account: '0131565776da85c196b81f35804a1d3dba073172c824b4f1d70f4e5a91e754a69f',
      timestamp: '2021-09-15T05:16:42.114Z',
      ttl: '30m',
      gas_price: 1,
      body_hash: 'dd3ebc7499b04c7219148f30791af7fb333d2e58530853a32d855aebf7115bbe',
      dependencies: [],
      chain_name: 'casper-net-1'
    },
    payment: { ModuleBytes: [Object] },
    session: { Transfer: [Object] },
    approvals: [ [Object] ]
  }
}

[x] Current state of the account:
{
  _accountHash: 'account-hash-ad45fbee174ad86066004988ca4a6729bd9fe3e79c9188fc107ef0f123e1f050',
  namedKeys: [],
  mainPurse: 'uref-0d1da53536ae5c845f31170fc642feb0620bb80046dc0e8e9f85fac3849d4dc5-007',
  associatedKeys: [
    {
      accountHash: 'account-hash-ad45fbee174ad86066004988ca4a6729bd9fe3e79c9188fc107ef0f123e1f050',
      weight: 1
    }
  ],
  actionThresholds: { deployment: 1, keyManagement: 1 }
}

[x]0.2 Install Keys Manager contract
Signed by: account-hash-ad45fbee174ad86066004988ca4a6729bd9fe3e79c9188fc107ef0f123e1f050
Deploy hash: ea58361edd4b5841e127f42bcacff62c400c886898cd2718500b89f0b3369f
Deploy result:

```

```

const keyManager = require('./key-manager');

(async function () {
    let deploy;

    // 0. Initial state of the account.
    // There should be only one associated key (facuet) with weight 1.
    // Deployment Threshold should be set to 1.
    // Key Management Threshold should be set to 1.
    let masterKey = keyManager.randomMasterKey();
    let mainAccount = masterKey.deriveIndex(1);

    console.log("\n0.1 Fund main account.\n");
    await keyManager.fundAccount(mainAccount);
    await keyManager.printAccount(mainAccount);
    await keyManager.printAccount(mainAccount);

    console.log("\n[x]0.2 Install Keys Manager contract");
    deploy = keyManager.keys.buildContractInstallDeploy(mainAccount);
    await keyManager.sendDeploy(deploy, [mainAccount]);
    await keyManager.printAccount(mainAccount);

    console.log("\nScenario 1: signing transactions with a single key");
    deploy = keyManager.keys.setDeploymentThresholdDeploy(mainAccount, mainAccount, 1);
    await keyManager.sendDeploy(deploy, [mainAccount]);
    deploy = keyManager.keys.setKeyManagementThresholdDeploy(mainAccount, 1);

```

Task 3 : Learn to transfer tokens to an account on the Casper Testnet

Deployment

```

--amount 69000000000 \
--chain-name casper-test \
--id 1 \
--node-address http://157.230.49.238:7777 \
--secret-key shr1ftyy_secret_key.pem \
--target-account 015c18219973d97ba176c7a7ea3b8863d178df6e85eadb53a6146478408d6abf78 \
--transfer-id 696969 \
--payment-amount 69
{
  "id": 1,
  "jsonrpc": "2.0",
  "result": {
    "api_version": "1.3.2",
    "deploy_hash": "6e3375082256d0cbc755a2d93b7eae21ee366d7acec67c73de9b3dcfa2210402"
  }
}

```

Task 4: Learn to Delegate and Undelegate on the Casper Testnet.

Delegation

```

--node-address http://157.230.49.238:7777/rpc \
--chain-name casper-test \
--session-path ../casper-node/target/wasm32-unknown-unknown/release/delegate.wasm \
--payment-amount 6 \
--session-arg "validator:public_key='017d96b9a63abcb61c870a4f55187a0a7ac24096bdb5fc585c12a686a4d892009e'" \
--session-arg "amount:u512='6'" \
--session-arg "delegator:public_key='0100b71207b4c0a87bc31a9318a818b24b821e1257756967c8808609858c3cf6e2'" \
--secret-key shr1fty_secret_key.pem
{
  "id": -2741863680129224303,
  "jsonrpc": "2.0",
  "result": {
    "api_version": "1.3.2",
    "deploy_hash": "995f1f4cc119398cec8a40c9aad0f6f0c9fa055cddd821937fb409468ab4d3dc"
  }
}

```

Undelegation

```

--node-address http://157.230.49.238:7777/rpc \
--chain-name casper-test \
--session-path ../casper-node/target/wasm32-unknown-unknown/release/undelegate.wasm \
--payment-amount 6 \
--session-arg "validator:public_key='017d96b9a63abcb61c870a4f55187a0a7ac24096bdb5fc585c12a686a4d892009e'" \
--session-arg "amount:u512='6'" \
--session-arg "delegator:public_key='0100b71207b4c0a87bc31a9318a818b24b821e1257756967c8808609858c3cf6e2'" \
--secret-key shr1fty_secret_key.pem
{
  "id": 5235324484793039110,
  "jsonrpc": "2.0",
  "result": {
    "api_version": "1.3.2",
    "deploy_hash": "e8ef780e15349321b4b45a3b1edb0dbb399697cf0029c70d33f814963544de50"
  }
}

```

Complete %%%