DYP STAKING & GOVERNANCE AUDIT

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BLOCKCHAIN CONSILIUM

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The audit makes no statements or warranties about utility of the code, safety of the code, suitability of the business model, regulatory regime for the business model, or any other statements about fitness of the contracts to purpose, or their bug free status. The audit documentation is for discussion purposes only.

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Introduction

We first thank dyp.finance for giving us the opportunity to audit their smart contract. This document outlines our methodology, audit details, and results.

dyp.finance asked us to review their DYP staking & governance smart contracts (GitHub Commit Hash: `92c497f0ff831e55b0b93a57d82b65604526ede1`). Blockchain Consilium reviewed the system from a technical perspective looking for bugs, issues and vulnerabilities in their code base. The Audit is valid for `92c497f0ff831e55b0b93a57d82b65604526ede1` GitHub Commit Hash only. The audit is not valid for any other versions of the smart contract. Read more below.

Audit Summary

This code is clean, thoughtfully written and in general well architected. The code conforms closely to the documentation and specification.

Overall, the code is clear on what it is supposed to do for each function. The visibility and state mutability of all the functions are clearly specified, and there are no confusions.

https://github.com/dypfinance/DYP-staking-governance-dapp/tree/92c497f0ff831e55b0b93a57d82b65604526ede1

Audit Result	**PASSED**
High Severity Issues	None
Moderate Severity Issues	None
Low Severity Issues	None
Informational Observations	1

Overview

The DeFi Yield Protocol is developing a unique platform that allows anyone to provide liquidity and to be rewarded for the first time with Ethereum. At the same time, the platform maintains both token price stability as well as secure and simplified DeFi for end users by integrating a DYP anti-manipulation feature.

Staking smart contract is supposed to allow users to stake Uniswap LP Tokens to receive WETH and DYP as rewards, a swap is performed with a set delay with a max price impact of ~2.5% for the swap.

Governance Smart Contract manages governance proposals for the Staking smart contract, and allows proposals reaching QUORUM to either disburse or burn the unswapped DYP Reward Tokens.

The project has one Solidity file for the DYP Staking Smart Contract, the Staking.sol file that contains about 1203 lines of Solidity code, and one Solidity file for the governance smart contract, the governance.sol that contains about 482 lines of solidity code. We manually reviewed each line of code in the smart contract.

Methodology:

Blockchain Consilium manually reviewed the smart contract line-by-line, keeping in mind industry best practices and known attacks, looking for any potential issues and vulnerabilities, and areas where improvements are possible.

We also used automated tools like slither for analysis and reviewing the smart contract. The raw output of these tools is included in the Appendix. These tools often give false-positives, and any issues reported by them but not included in the issue list can be considered not valid.

Classification / Issue Types Definition:

1. **High Severity:** which presents a significant security vulnerability or failure of the contract across a range of scenarios, or which may result in loss of funds.
2. **Moderate Severity:** which affects the desired outcome of the contract execution or introduces a weakness that can be exploited. It may not result in loss of funds but breaks the functionality or produces unexpected behaviour.
3. **Low Severity:** which does not have a material impact on the contract execution and is likely to be subjective.

The smart contract is considered to pass the audit, as of the audit date, if no high severity or moderate severity issues are found.

Attacks & Issues considered while auditing

In order to check for the security of the contract, we reviewed each line of code in the smart contract considering several known Smart Contract Attacks & known issues.

- **Overflows and underflows:**
  An overflow happens when the limit of the type variable uint256 , 2 ** 256, is

exceeded. What happens is that the value resets to zero instead of incrementing more.

For instance, if we want to assign a value to a uint bigger than 2 ** 256 it will simple go to 0—this is dangerous.

On the other hand, an underflow happens when you try to subtract 0 minus a number bigger than 0.For example, if you subtract 0 - 1 the result will be = 2 ** 256 instead of -1.

This is quite dangerous. This contract **DOES** check for overflows and underflows, using **OpenZeppelin's** *SafeMath* for overflow and underflow protection.

- **Reentrancy Attack:**
  One of the major dangers of calling external contracts is that they can take over the control flow, and make changes to your data that the calling function wasn't expecting. This class of bug can take many forms, and both of the major bugs that led to the DAO's collapse were bugs of this sort.

  This smart contract does make state changes after external calls, however the token contracts, uniswap pair and external calls are trusted and thus *is not found vulnerable* to re-entrancy attack.

- **Replay attack:**
  The replay attack consists of making a transaction on one blockchain like the original Ethereum's blockchain and then repeating it on another blockchain like the Ethereum's classic blockchain. The ether is transferred like a normal transaction from a blockchain to another. Though it's no longer a problem because since the version 1.5.3 of *Geth* and 1.4.4 of *Parity* both implement the attack protection EIP 155 by Vitalik Buterin.
  So the people that will use the contract depend on their own ability to be updated with those programs to keep themselves secure.

- **Short address attack:**
  This attack affects ERC20 tokens, was discovered by the Golem team and consists of the following:

  A user creates an Ethereum wallet with a trailing 0, which is not hard because it's only a digit. For instance: `0xiofa8d97756as7df5sd8f75g8675ds8gsdg0`
  Then he buys tokens by removing the last zero:
  Buy 1000 tokens from account `0xiofa8d97756as7df5sd8f75g8675ds8gsdg.` If the contract has enough amount of tokens and the buy function doesn't check

the length of the address of the sender, the Ethereum's virtual machine will just add zeroes to the transaction until the address is complete.

The virtual machine will return 256000 for each 1000 tokens bought. This is abug of the virtual machine.

Here is a **fix for short address attacks**

```
modifier onlyPayloadSize(uint size) {
    assert(msg.data.length >= size + 4);
    _;
}
function transfer(address _to, uint256 _value) onlyPayloadSize(2 * 32) {
    // do stuff
}
```

This contract is not an ERC20 Token, thus checks for erc20 short address attacks are not needed.

You can read more about the attack here: ERC20 Short Address Attacks.

- **Approval Double-spend**

  ERC20 Standard allows users to approve other users to manage their tokens, or spend tokens from their account till a certain amount, by setting the user's allowance with the standard `approve` function, then the allowed user may use `transferFrom` to spend the allowed tokens.

  Hypothetically, given a situation where Alice approves Bob to spend 100 Tokens from her account, and if Alice needs to adjust the allowance to allow Bob to spend 20 more tokens, normally – she'd check Bob's allowance (100 currently) and start a new `approve` transaction allowing Bob to spend a total of 120 Tokens instead of 100 Tokens.

  Now, if Bob is monitoring the Transaction pool, and as soon as he observes new transaction from Alice approving more amount, he may send a `transferFrom` transaction spending 100 Tokens from Alice's account with higher gas price and do all the required effort to get his spend transaction mined before Alice's new approve transaction.

  Now Bob has already spent 100 Tokens, and given Alice's approve transaction is mined, Bob's allowance is set to 120 Tokens, this would allow Bob to spend a total of 100 + 120 = 220 Tokens from Alice's account instead of the allowed 120 Tokens. This exploit situation is known as Approval Double-Spend Attack.

  A potential solution to minimize these instances would be to set the non-zero allowance to 0 before setting it to any other amount.

It's possible for `approve` to enforce this behaviour without interface changes in the ERC20 specification:

```
if ((_value != 0) && (approved[msg.sender][_spender] != 0)) return false;
```

However, this is just an attempt to modify user behaviour. If the user does attempt to change from one non-zero value to another, the double spend might still happen, since the attacker may set the value to zero by already spending all the previously allowed value before the user's new approval transaction.

If desired, a non-standard function can be added to minimize hassle for users. The issue can be fixed with minimal inconvenience by taking a change value rather than a replacement value:

```
function increaseAllowance (address _spender, uint256 _addedValue)
returns (bool success) {
  uint oldValue = approved[msg.sender][_spender];
  approved[msg.sender][_spender] = safeAdd(oldValue, _addedValue);
  return true;
}
```

Even if this function is added, it's important to keep the original for compatibility with the ERC20 specification.

This contract is not an ERC20 Token, thus checks for approval-doublespend are not needed.

For more, see this discussion on GitHub:
https://github.com/ethereum/EIPs/issues/20#issuecomment263524729

Issues Found & Informational Observations

High Severity Issues

No high severity issues were found in the smart contract.

Moderate Severity Issues

No moderate severity issues were found in the smart contract.

Low Severity Issues

No low severity issues were found in the smart contract.

Informational Observations

The Staking smart contract depends on immediate token reserves on Uniswap of the DYP Token for price impact calculations, which is usually the way such calculations are made. Though prices on DEX are subject to manipulation, usually for very short durations of time, if a large liquidity is not available for the token pair.

Flash loans and various DeFi options have made it easier for malicious attackers to execute transactions to manipulate Token Price and Immediate Token Reserves on DEXs and execute unfair trades.

By including a `noContractsAllowed` modifier, the smart contract does it's best to prevent flash loan exploits as of the audit date.

However, appropriate research must be done and appropriate care must be taken while using the smart contracts.

Line by line comments

Staking.sol

- Line 1:
  The compiler version is specified as 0.6.11, this means the code can be compiled with solidity compilers with 0.6.11 only, the latest compiler version at the time of auditing is 0.7.5.

- Lines 3 to 33:
  SafeMath library is included to check for underflow and overflows.

- Lines 35 to 273:
  EnumerableSet library is included to implement address sets in the smart contract for keeping track of stakers list.

- Lines 275 to 459:
  OpenZeppelin's Address library is included to check if an address is contract or not.

- Lines 461 to 500:
  Ownable contract is implemented to provide basic access control for transferring out other tokens except WETH and LP from this smart contract.

- Lines 502 to 511:
  Token interfaces is included to interact with ERC20 tokens.

- Lines 513 to 695:
  Uniswap Pair & Router Interfaces are included

- Lines 697 to 1203:
  `FarmProRata` contract is implemented inheriting from Ownable contract. This contract implements deposit and withdraw functions, a noContractsAllowed modifier to make sure other smart contracts do not interact with this smart contract – useful measure to make flash loan exploits even harder to do.

  For every deposit and withdraw user's pending rewards are auto-claimed.

  Every set delay a swap is attempted with a max price impact of ~2.5%. The swapped WETH is distributed to LP stakers at pro-rata basis. It allows governance to either disburse or burn the unswapped DYP every set delay. Disbursed DYP is distributed to stakers at pro-rata basis.

An emergencyWithdraw function is available to allow stakers to unstake their LP without caring about their rewards – this function may be useful in emergency situations, though such emergency situations are very rare.

governance.sol

- Line 1:
  The compiler version is specified as 0.6.11, this means the code can be compiled with solidity compilers with 0.6.11 only, the latest compiler version at the time of auditing is 0.7.5.

- Lines 3 to 33:
  SafeMath library is included to check for underflow and overflows.

- Lines 34 to 218:
  OpenZeppelin's Address library is included to check if an address is contract or not.

- Lines 221 to 222:
  Token and StakingPool interfaces is included to interact with ERC20 tokens and StakingPools respectively.

- Lines 234 to 482:
  Governance smart contract is implemented, this contract contains a `noContractsAllowed` modifier as well, useful for making flash loan exploits difficult. 1 DYP is considered as 1 vote for any proposal.

  It allows DYP Token Holders to initiate a proposal and allows users to vote for / against proposals using DYP Tokens, winning proposals reaching QUORUM are executed. Users can withdraw their DYP Tokens once the latest proposal they voted for is over, users can unvote for active proposals anytime and withdraw their respective DYP Tokens anytime.

Appendix

Smart Contract Summary

Staking.sol:

- Contract SafeMath (Most derived contract)
    - From SafeMath
        - add(uint256,uint256) (internal)
        - div(uint256,uint256) (internal)
        - mul(uint256,uint256) (internal)
        - sub(uint256,uint256) (internal)
- Contract EnumerableSet (Most derived contract)
    - From EnumerableSet
        - _add(EnumerableSet.Set,bytes32) (private)
        - _at(EnumerableSet.Set,uint256) (private)
        - _contains(EnumerableSet.Set,bytes32) (private)
        - _length(EnumerableSet.Set) (private)
        - _remove(EnumerableSet.Set,bytes32) (private)
        - add(EnumerableSet.AddressSet,address) (internal)
        - add(EnumerableSet.UintSet,uint256) (internal)
        - at(EnumerableSet.AddressSet,uint256) (internal)
        - at(EnumerableSet.UintSet,uint256) (internal)
        - contains(EnumerableSet.AddressSet,address) (internal)
        - contains(EnumerableSet.UintSet,uint256) (internal)
        - length(EnumerableSet.AddressSet) (internal)
        - length(EnumerableSet.UintSet) (internal)
        - remove(EnumerableSet.AddressSet,address) (internal)
        - remove(EnumerableSet.UintSet,uint256) (internal)
- Contract Address (Most derived contract)
    - From Address
        - _verifyCallResult(bool,bytes,string) (private)
        - functionCall(address,bytes) (internal)
        - functionCall(address,bytes,string) (internal)
        - functionCallWithValue(address,bytes,uint256) (internal)

        - functionCallWithValue(address,bytes,uint256,string) (internal)
        - functionDelegateCall(address,bytes) (internal)
        - functionDelegateCall(address,bytes,string) (internal)
        - functionStaticCall(address,bytes) (internal)
        - functionStaticCall(address,bytes,string) (internal)
        - isContract(address) (internal)
        - sendValue(address,uint256) (internal)

- Contract Ownable
    - From Ownable
        - constructor() (public)
        - transferOwnership(address) (public)
- Contract Token (Most derived contract)
    - From Token
        - approve(address,uint256) (external)
        - balanceOf(address) (external)
        - transfer(address,uint256) (external)
        - transferFrom(address,address,uint256) (external)
- Contract OldIERC20 (Most derived contract)
    - From OldIERC20
        - transfer(address,uint256) (external)
- Contract IUniswapV2Router01
    - From IUniswapV2Router01
        - WETH() (external)
        - addLiquidity(address,address,uint256,uint256,uint256,uint256,address,uint256) (external)
        - addLiquidityETH(address,uint256,uint256,uint256,address,uint256) (external)
        - factory() (external)
        - getAmountIn(uint256,uint256,uint256) (external)
        - getAmountOut(uint256,uint256,uint256) (external)
        - getAmountsIn(uint256,address[]) (external)
        - getAmountsOut(uint256,address[]) (external)
        - quote(uint256,uint256,uint256) (external)

        - removeLiquidity(address,address,uint256,uint256,uint256,address,uint256) (external)
        - removeLiquidityETH(address,uint256,uint256,uint256,address,uint256) (external)
        - removeLiquidityETHWithPermit(address,uint256,uint256,uint256,address,uint256,bool,uint8,bytes32,bytes32) (external)
        - removeLiquidityWithPermit(address,address,uint256,uint256,uint256,address,uint256,bool,uint8,bytes32,bytes32) (external)
        - swapETHForExactTokens(uint256,address[],address,uint256) (external)
        - swapExactETHForTokens(uint256,address[],address,uint256) (external)
        - swapExactTokensForETH(uint256,uint256,address[],address,uint256) (external)
        - swapExactTokensForTokens(uint256,uint256,address[],address,uint256) (external)
        - swapTokensForExactETH(uint256,uint256,address[],address,uint256) (external)
        - swapTokensForExactTokens(uint256,uint256,address[],address,uint256) (external)

- Contract IUniswapV2Router02 (Most derived contract)

    - From IUniswapV2Router01
        - WETH() (external)
        - addLiquidity(address,address,uint256,uint256,uint256,uint256,address,uint256) (external)
        - addLiquidityETH(address,uint256,uint256,uint256,address,uint256) (external)
        - factory() (external)
        - getAmountIn(uint256,uint256,uint256) (external)
        - getAmountOut(uint256,uint256,uint256) (external)
        - getAmountsIn(uint256,address[]) (external)
        - getAmountsOut(uint256,address[]) (external)
        - quote(uint256,uint256,uint256) (external)
        - removeLiquidity(address,address,uint256,uint256,uint256,address,uint256) (external)
        - removeLiquidityETH(address,uint256,uint256,uint256,address,uint256) (external)

        - removeLiquidityETHWithPermit(address,uint256,uint256,uint256,address,uint256,bool,uint8,bytes32,bytes32) (external)
        - removeLiquidityWithPermit(address,address,uint256,uint256,uint256,address,uint256,bool,uint8,bytes32,bytes32) (external)
        - swapETHForExactTokens(uint256,address[],address,uint256) (external)
        - swapExactETHForTokens(uint256,address[],address,uint256) (external)
        - swapExactTokensForETH(uint256,uint256,address[],address,uint256) (external)
        - swapExactTokensForTokens(uint256,uint256,address[],address,uint256) (external)
        - swapTokensForExactETH(uint256,uint256,address[],address,uint256) (external)
        - swapTokensForExactTokens(uint256,uint256,address[],address,uint256) (external)
    - From IUniswapV2Router02
        - removeLiquidityETHSupportingFeeOnTransferTokens(address,uint256,uint256,uint256,address,uint256) (external)
        - removeLiquidityETHWithPermitSupportingFeeOnTransferTokens(address,uint256,uint256,uint256,address,uint256,bool,uint8,bytes32,bytes32) (external)
        - swapExactETHForTokensSupportingFeeOnTransferTokens(uint256,address[],address,uint256) (external)
        - swapExactTokensForETHSupportingFeeOnTransferTokens(uint256,uint256,address[],address,uint256) (external)
        - swapExactTokensForTokensSupportingFeeOnTransferTokens(uint256,uint256,address[],address,uint256) (external)

- Contract IUniswapV2Pair (Most derived contract)
    - From IUniswapV2Pair
        - DOMAIN_SEPARATOR() (external)
        - MINIMUM_LIQUIDITY() (external)
        - PERMIT_TYPEHASH() (external)
        - allowance(address,address) (external)
        - approve(address,uint256) (external)
        - balanceOf(address) (external)
        - burn(address) (external)
        - decimals() (external)

        - factory() (external)
        - getReserves() (external)
        - kLast() (external)
        - mint(address) (external)
        - name() (external)
        - nonces(address) (external)
        - permit(address,address,uint256,uint256,uint8,bytes32,bytes32) (external)
        - price0CumulativeLast() (external)
        - price1CumulativeLast() (external)
        - skim(address) (external)
        - swap(uint256,uint256,address,bytes) (external)
        - symbol() (external)
        - sync() (external)
        - token0() (external)
        - token1() (external)
        - totalSupply() (external)
        - transfer(address,uint256) (external)
        - transferFrom(address,address,uint256) (external)

- Contract FarmProRata (Most derived contract)
    - From Ownable
        - constructor() (public)
        - transferOwnership(address) (public)
    - From FarmProRata
        - addContractBalance(uint256) (public)
        - attemptSwap() (private)
        - burnRewardTokens() (public)
        - claim() (public)
        - constructor(address[]) (public)
        - deposit(uint256) (public)
        - disburseRewardTokens() (public)
        - disburseTokens() (private)
        - distributeDivs(uint256) (private)
        - distributeDivsEth(uint256) (private)
        - doSwap() (private)
        - emergencyWithdraw(uint256) (public)

        - getDepositorsList(uint256,uint256) (public)
        - getMaxSwappableAmount() (public)
        - getNumberOfHolders() (public)
        - getPendingDisbursement() (public)
        - getPendingDivs(address) (public)
        - getPendingDivsEth(address) (public)
        - transferAnyERC20Token(address,address,uint256) (public)
        - transferAnyOldERC20Token(address,address,uint256) (public)
        - updateAccount(address) (private)
        - withdraw(uint256) (public)

governance.sol:

- Contract SafeMath (Most derived contract)
    - From SafeMath
        - add(uint256,uint256) (internal)
        - div(uint256,uint256) (internal)
        - mul(uint256,uint256) (internal)
        - sub(uint256,uint256) (internal)
- Contract Address (Most derived contract)
    - From Address
        - _verifyCallResult(bool,bytes,string) (private)
        - functionCall(address,bytes) (internal)
        - functionCall(address,bytes,string) (internal)
        - functionCallWithValue(address,bytes,uint256) (internal)
        - functionCallWithValue(address,bytes,uint256,string) (internal)
        - functionDelegateCall(address,bytes) (internal)
        - functionDelegateCall(address,bytes,string) (internal)
        - functionStaticCall(address,bytes) (internal)
        - functionStaticCall(address,bytes,string) (internal)
        - isContract(address) (internal)
        - sendValue(address,uint256) (internal)
- Contract Token (Most derived contract)
    - From Token
        - approve(address,uint256) (external)

        - balanceOf(address) (external)
        - transfer(address,uint256) (external)
        - transferFrom(address,address,uint256) (external)

- Contract StakingPool (Most derived contract)
    - From StakingPool
        - burnRewardTokens() (external)
        - disburseRewardTokens() (external)
        - transferOwnership(address) (external)

- Contract Governance (Most derived contract)
    - From Governance
        - addVotes(uint256,Governance.Option,uint256) (external)
        - executeProposal(uint256) (external)
        - getProposal(uint256) (external)
        - isProposalExecutible(uint256) (public)
        - isProposalOpen(uint256) (public)
        - proposeDisburseOrBurn(StakingPool) (external)
        - proposeUpgradeGovernance(StakingPool,address) (external)
        - removeVotes(uint256,uint256) (external)
        - withdrawAllTokens() (external)

Slither Results

Staking.sol

```
> slither Staking.sol

INFO:Detectors:
OldIERC20 (Staking.sol#509-511) has incorrect ERC20 function
interface:OldIERC20.transfer(address,uint256) (Staking.sol#510)
Reference: https://github.com/crytic/slither/wiki/Detector-
Documentation#incorrect-erc20-interface
INFO:Detectors:
FarmProRata.disburseTokens() (Staking.sol#1003-1015) uses a dangerous strict
equality:
        - amount == 0 || totalTokens == 0 (Staking.sol#1009)
FarmProRata.doSwap() (Staking.sol#1021-1091) uses a dangerous strict equality:
        - maxSwappableAmount == 0 (Staking.sol#1040)
FarmProRata.doSwap() (Staking.sol#1021-1091) uses a dangerous strict equality:
        - _tokensToBeSwapped == 0 (Staking.sol#1062)
Reference: https://github.com/crytic/slither/wiki/Detector-
Documentation#dangerous-strict-equalities
INFO:Detectors:
```

```
Reentrancy in FarmProRata.burnRewardTokens() (Staking.sol#1120-1125):
        External calls:
        -
require(bool,string)(Token(trustedRewardTokenAddress).transfer(BURN_ADDRESS,tokens
ToBeDisbursedOrBurnt),burnRewardTokens failed!) (Staking.sol#1122)
        State variables written after the call(s):
        - lastBurnOrTokenDistributeTime = now (Staking.sol#1124)
        - tokensToBeDisbursedOrBurnt = 0 (Staking.sol#1123)
Reentrancy in FarmProRata.deposit(uint256) (Staking.sol#924-938):
        External calls:
        - updateAccount(msg.sender) (Staking.sol#927)
                -
require(bool,string)(Token(trustedRewardTokenAddress).transfer(account,pendingDivs
),Could not transfer tokens.) (Staking.sol#869)
                - uniswapV2Pair.sync() (Staking.sol#1033)
                -
require(bool,string)(Token(uniswapRouterV2.WETH()).transfer(account,pendingDivsEth
),Could not transfer WETH!) (Staking.sol#877)
                -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
                -
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
        -
require(bool,string)(Token(trustedDepositTokenAddress).transferFrom(msg.sender,add
ress(this),amountToDeposit),Insufficient Token Allowance) (Staking.sol#929)
        State variables written after the call(s):
        - depositedTokens[msg.sender] =
depositedTokens[msg.sender].add(amountToDeposit) (Staking.sol#931)
        - totalTokens = totalTokens.add(amountToDeposit) (Staking.sol#932)
Reentrancy in FarmProRata.disburseRewardTokens() (Staking.sol#1094-1116):
        External calls:
        - uniswapV2Pair.sync() (Staking.sol#1098)
        -
require(bool,string)(Token(trustedRewardTokenAddress).transfer(BURN_ADDRESS,_token
sToBeBurnt),disburseRewardTokens: burn failed!) (Staking.sol#1112)
        State variables written after the call(s):
        - lastBurnOrTokenDistributeTime = now (Staking.sol#1115)
        - tokensToBeDisbursedOrBurnt = 0 (Staking.sol#1114)
Reentrancy in FarmProRata.doSwap() (Staking.sol#1021-1091):
        External calls:
        - uniswapV2Pair.sync() (Staking.sol#1033)
        -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
        -
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
        State variables written after the call(s):
        - lastSwapExecutionTime = now (Staking.sol#1090)
Reentrancy in FarmProRata.emergencyWithdraw(uint256) (Staking.sol#960-981):
        External calls:
        -
require(bool,string)(Token(trustedDepositTokenAddress).transfer(msg.sender,amountT
oWithdraw),Could not transfer tokens.) (Staking.sol#973)
        State variables written after the call(s):
        - depositedTokens[msg.sender] =
depositedTokens[msg.sender].sub(amountToWithdraw) (Staking.sol#975)
```

```
        - totalTokens = totalTokens.sub(amountToWithdraw) (Staking.sol#976)
Reentrancy in FarmProRata.updateAccount(address) (Staking.sol#864-886):
        External calls:
        - attemptSwap() (Staking.sol#866)
                - uniswapV2Pair.sync() (Staking.sol#1033)
                -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
                -
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
        -
require(bool,string)(Token(trustedRewardTokenAddress).transfer(account,pendingDivs
),Could not transfer tokens.) (Staking.sol#869)
        -
require(bool,string)(Token(uniswapRouterV2.WETH()).transfer(account,pendingDivsEth
),Could not transfer WETH!) (Staking.sol#877)
        State variables written after the call(s):
        - lastDivPoints[account] = totalDivPoints (Staking.sol#884)
        - lastEthDivPoints[account] = totalEthDivPoints (Staking.sol#885)
Reentrancy in FarmProRata.withdraw(uint256) (Staking.sol#941-957):
        External calls:
        - updateAccount(msg.sender) (Staking.sol#947)
                -
require(bool,string)(Token(trustedRewardTokenAddress).transfer(account,pendingDivs
),Could not transfer tokens.) (Staking.sol#869)
                - uniswapV2Pair.sync() (Staking.sol#1033)
                -
require(bool,string)(Token(uniswapRouterV2.WETH()).transfer(account,pendingDivsEth
),Could not transfer WETH!) (Staking.sol#877)
                -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
                -
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
        -
require(bool,string)(Token(trustedDepositTokenAddress).transfer(msg.sender,amountT
oWithdraw),Could not transfer tokens.) (Staking.sol#949)
        State variables written after the call(s):
        - depositedTokens[msg.sender] =
depositedTokens[msg.sender].sub(amountToWithdraw) (Staking.sol#951)
        - totalTokens = totalTokens.sub(amountToWithdraw) (Staking.sol#952)
Reference: https://github.com/crytic/slither/wiki/Detector-
Documentation#reentrancy-vulnerabilities-1
INFO:Detectors:
FarmProRata.disburseRewardTokens()._tokensToBeBurnt (Staking.sol#1103) is a local
variable never initialized
Reference: https://github.com/crytic/slither/wiki/Detector-
Documentation#uninitialized-local-variables
INFO:Detectors:
FarmProRata.deposit(uint256) (Staking.sol#924-938) ignores return value by
holders.add(msg.sender) (Staking.sol#935)
FarmProRata.withdraw(uint256) (Staking.sol#941-957) ignores return value by
holders.remove(msg.sender) (Staking.sol#955)
FarmProRata.emergencyWithdraw(uint256) (Staking.sol#960-981) ignores return value
by holders.remove(msg.sender) (Staking.sol#979)
```

```
FarmProRata.doSwap() (Staking.sol#1021-1091) ignores return value by
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#unused-
return
INFO:Detectors:
Reentrancy in FarmProRata.addContractBalance(uint256) (Staking.sol#857-860):
        External calls:
        -
require(bool,string)(Token(trustedRewardTokenAddress).transferFrom(msg.sender,addr
ess(this),amount),Cannot add balance!) (Staking.sol#858)
        State variables written after the call(s):
        - contractBalance = contractBalance.add(amount) (Staking.sol#859)
Reentrancy in FarmProRata.deposit(uint256) (Staking.sol#924-938):
        External calls:
        - updateAccount(msg.sender) (Staking.sol#927)
                -
require(bool,string)(Token(trustedRewardTokenAddress).transfer(account,pendingDivs
),Could not transfer tokens.) (Staking.sol#869)
                - uniswapV2Pair.sync() (Staking.sol#1033)
                -
require(bool,string)(Token(uniswapRouterV2.WETH()).transfer(account,pendingDivsEth
),Could not transfer WETH!) (Staking.sol#877)
                -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
                -
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
        -
require(bool,string)(Token(trustedDepositTokenAddress).transferFrom(msg.sender,add
ress(this),amountToDeposit),Insufficient Token Allowance) (Staking.sol#929)
        State variables written after the call(s):
        - depositTime[msg.sender] = now (Staking.sol#937)
Reentrancy in FarmProRata.disburseRewardTokens() (Staking.sol#1094-1116):
        External calls:
        - uniswapV2Pair.sync() (Staking.sol#1098)
        State variables written after the call(s):
        - distributeDivs(_tokensToBeDisbursed) (Staking.sol#1110)
                - totalDivPoints =
totalDivPoints.add(amount.mul(pointMultiplier).div(totalTokens)) (Staking.sol#991)
Reentrancy in FarmProRata.doSwap() (Staking.sol#1021-1091):
        External calls:
        - uniswapV2Pair.sync() (Staking.sol#1033)
        State variables written after the call(s):
        - tokensToBeDisbursedOrBurnt = tokensToBeDisbursedOrBurnt.add(diff)
(Staking.sol#1046)
        - tokensToBeDisbursedOrBurnt = diff_scope_0 (Staking.sol#1053)
        - tokensToBeDisbursedOrBurnt = 0 (Staking.sol#1058)
        - tokensToBeSwapped = 0 (Staking.sol#1047)
        - tokensToBeSwapped = 0 (Staking.sol#1054)
        - tokensToBeSwapped = 0 (Staking.sol#1057)
Reentrancy in FarmProRata.doSwap() (Staking.sol#1021-1091):
        External calls:
        - uniswapV2Pair.sync() (Staking.sol#1033)
        -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
```

```
        -
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
        State variables written after the call(s):
        - distributeDivsEth(wethReceived) (Staking.sol#1087)
                - totalEthDivPoints =
totalEthDivPoints.add(amount.mul(pointMultiplier).div(totalTokens))
(Staking.sol#998)
Reentrancy in FarmProRata.updateAccount(address) (Staking.sol#864-886):
        External calls:
        - attemptSwap() (Staking.sol#866)
                - uniswapV2Pair.sync() (Staking.sol#1033)
                -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
                -
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
        -
require(bool,string)(Token(trustedRewardTokenAddress).transfer(account,pendingDivs
),Could not transfer tokens.) (Staking.sol#869)
        State variables written after the call(s):
        - totalClaimedRewards = totalClaimedRewards.add(pendingDivs)
(Staking.sol#871)
        - totalEarnedTokens[account] =
totalEarnedTokens[account].add(pendingDivs) (Staking.sol#870)
Reentrancy in FarmProRata.updateAccount(address) (Staking.sol#864-886):
        External calls:
        - attemptSwap() (Staking.sol#866)
                - uniswapV2Pair.sync() (Staking.sol#1033)
                -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
                -
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
        -
require(bool,string)(Token(trustedRewardTokenAddress).transfer(account,pendingDivs
),Could not transfer tokens.) (Staking.sol#869)
        -
require(bool,string)(Token(uniswapRouterV2.WETH()).transfer(account,pendingDivsEth
),Could not transfer WETH!) (Staking.sol#877)
        State variables written after the call(s):
        - lastClaimedTime[account] = now (Staking.sol#883)
        - totalClaimedRewardsEth = totalClaimedRewardsEth.add(pendingDivsEth)
(Staking.sol#879)
        - totalEarnedEth[account] = totalEarnedEth[account].add(pendingDivsEth)
(Staking.sol#878)
Reference: https://github.com/crytic/slither/wiki/Detector-
Documentation#reentrancy-vulnerabilities-2
INFO:Detectors:
Reentrancy in FarmProRata.disburseRewardTokens() (Staking.sol#1094-1116):
        External calls:
        - uniswapV2Pair.sync() (Staking.sol#1098)
        Event emitted after the call(s):
        - RewardsDisbursed(amount) (Staking.sol#992)
                - distributeDivs(_tokensToBeDisbursed) (Staking.sol#1110)
Reentrancy in FarmProRata.doSwap() (Staking.sol#1021-1091):
        External calls:
```

```
        - uniswapV2Pair.sync() (Staking.sol#1033)
        -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
        -
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
        Event emitted after the call(s):
        - EthRewardsDisbursed(amount) (Staking.sol#999)
                - distributeDivsEth(wethReceived) (Staking.sol#1087)
Reentrancy in FarmProRata.updateAccount(address) (Staking.sol#864-886):
        External calls:
        - attemptSwap() (Staking.sol#866)
                - uniswapV2Pair.sync() (Staking.sol#1033)
                -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
                -
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
        -
require(bool,string)(Token(trustedRewardTokenAddress).transfer(account,pendingDivs
),Could not transfer tokens.) (Staking.sol#869)
        Event emitted after the call(s):
        - RewardsTransferred(account,pendingDivs) (Staking.sol#872)
Reentrancy in FarmProRata.updateAccount(address) (Staking.sol#864-886):
        External calls:
        - attemptSwap() (Staking.sol#866)
                - uniswapV2Pair.sync() (Staking.sol#1033)
                -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
                -
uniswapRouterV2.swapExactTokensForTokens(_tokensToBeSwapped,amountOutMin,SWAP_PATH
,address(this),block.timestamp) (Staking.sol#1080)
        -
require(bool,string)(Token(trustedRewardTokenAddress).transfer(account,pendingDivs
),Could not transfer tokens.) (Staking.sol#869)
        -
require(bool,string)(Token(uniswapRouterV2.WETH()).transfer(account,pendingDivsEth
),Could not transfer WETH!) (Staking.sol#877)
        Event emitted after the call(s):
        - EthRewardsTransferred(account,pendingDivsEth) (Staking.sol#880)
Reference: https://github.com/crytic/slither/wiki/Detector-
Documentation#reentrancy-vulnerabilities-3
INFO:Detectors:
FarmProRata.withdraw(uint256) (Staking.sol#941-957) uses timestamp for comparisons
        Dangerous comparisons:
        - require(bool,string)(now.sub(depositTime[msg.sender]) > cliffTime,You
recently deposited, please wait before withdrawing.) (Staking.sol#945)
FarmProRata.emergencyWithdraw(uint256) (Staking.sol#960-981) uses timestamp for
comparisons
        Dangerous comparisons:
        - require(bool,string)(now.sub(depositTime[msg.sender]) > cliffTime,You
recently deposited, please wait before withdrawing.) (Staking.sol#964)
FarmProRata.disburseTokens() (Staking.sol#1003-1015) uses timestamp for
comparisons
        Dangerous comparisons:
        - contractBalance < amount (Staking.sol#1006)
```

```
        - amount == 0 || totalTokens == 0 (Staking.sol#1009)
FarmProRata.doSwap() (Staking.sol#1021-1091) uses timestamp for comparisons
        Dangerous comparisons:
        - now.sub(lastSwapExecutionTime) < swapAttemptPeriod (Staking.sol#1028)
        - maxSwappableAmount < tokensToBeSwapped (Staking.sol#1042)
        - maxSwappableAmount < _tokensToBeSwapped (Staking.sol#1049)
        - _tokensToBeSwapped == 0 (Staking.sol#1062)
        - Token(trustedRewardTokenAddress).balanceOf(address(this)) <
_tokensToBeSwapped (Staking.sol#1067)
        -
require(bool,string)(Token(trustedRewardTokenAddress).approve(address(uniswapRoute
rV2),_tokensToBeSwapped),approve failed!) (Staking.sol#1071)
        - require(bool,string)(wethReceived >= amountOutMin,Invalid SWAP!)
(Staking.sol#1084)
FarmProRata.disburseRewardTokens() (Staking.sol#1094-1116) uses timestamp for
comparisons
        Dangerous comparisons:
        - require(bool,string)(now.sub(lastBurnOrTokenDistributeTime) >
burnOrDisburseTokensPeriod,Recently executed, Please wait!) (Staking.sol#1095)
FarmProRata.burnRewardTokens() (Staking.sol#1120-1125) uses timestamp for
comparisons
        Dangerous comparisons:
        - require(bool,string)(now.sub(lastBurnOrTokenDistributeTime) >
burnOrDisburseTokensPeriod,Recently executed, Please wait!) (Staking.sol#1121)
        -
require(bool,string)(Token(trustedRewardTokenAddress).transfer(BURN_ADDRESS,tokens
ToBeDisbursedOrBurnt),burnRewardTokens failed!) (Staking.sol#1122)
FarmProRata.getPendingDisbursement() (Staking.sol#1138-1157) uses timestamp for
comparisons
        Dangerous comparisons:
        - _now > _stakingEndTime (Staking.sol#1142)
        - lastDisburseTime >= _now (Staking.sol#1145)
FarmProRata.transferAnyERC20Token(address,address,uint256) (Staking.sol#1189-1193)
uses timestamp for comparisons
        Dangerous comparisons:
        - require(bool,string)((_tokenAddr != trustedRewardTokenAddress &&
_tokenAddr != uniswapRouterV2.WETH()) || (now > adminClaimableTime),Admin cannot
Transfer out Reward Tokens or WETH Yet!) (Staking.sol#1191)
FarmProRata.transferAnyOldERC20Token(address,address,uint256) (Staking.sol#1196-
1202) uses timestamp for comparisons
        Dangerous comparisons:
        - require(bool,string)((_tokenAddr != trustedRewardTokenAddress &&
_tokenAddr != uniswapRouterV2.WETH()) || (now > adminClaimableTime),Admin cannot
Transfer out Reward Tokens or WETH Yet!) (Staking.sol#1199)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#block-
timestamp
INFO:Detectors:
Address.isContract(address) (Staking.sol#296-305) uses assembly
        - INLINE ASM (Staking.sol#303)
Address._verifyCallResult(bool,bytes,string) (Staking.sol#441-458) uses assembly
        - INLINE ASM (Staking.sol#450-453)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#assembly-
usage
INFO:Detectors:
Low level call in Address.sendValue(address,uint256) (Staking.sol#323-329):
        - (success) = recipient.call{value: amount}() (Staking.sol#327)
Low level call in Address.functionCallWithValue(address,bytes,uint256,string)
(Staking.sol#384-391):
```

```
        - (success,returndata) = target.call{value: value}(data)
(Staking.sol#389)
Low level call in Address.functionStaticCall(address,bytes,string)
(Staking.sol#409-415):
        - (success,returndata) = target.staticcall(data) (Staking.sol#413)
Low level call in Address.functionDelegateCall(address,bytes,string)
(Staking.sol#433-439):
        - (success,returndata) = target.delegatecall(data) (Staking.sol#437)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#low-
level-calls
INFO:Detectors:
Function IUniswapV2Router01.WETH() (Staking.sol#515) is not in mixedCase
Function IUniswapV2Pair.DOMAIN_SEPARATOR() (Staking.sol#663) is not in mixedCase
Function IUniswapV2Pair.PERMIT_TYPEHASH() (Staking.sol#664) is not in mixedCase
Function IUniswapV2Pair.MINIMUM_LIQUIDITY() (Staking.sol#681) is not in mixedCase
Parameter FarmProRata.getPendingDivs(address)._holder (Staking.sol#889) is not in
mixedCase
Parameter FarmProRata.getPendingDivsEth(address)._holder (Staking.sol#903) is not
in mixedCase
Parameter FarmProRata.transferAnyERC20Token(address,address,uint256)._tokenAddr
(Staking.sol#1189) is not in mixedCase
Parameter FarmProRata.transferAnyERC20Token(address,address,uint256)._to
(Staking.sol#1189) is not in mixedCase
Parameter FarmProRata.transferAnyERC20Token(address,address,uint256)._amount
(Staking.sol#1189) is not in mixedCase
Parameter FarmProRata.transferAnyOldERC20Token(address,address,uint256)._tokenAddr
(Staking.sol#1196) is not in mixedCase
Parameter FarmProRata.transferAnyOldERC20Token(address,address,uint256)._to
(Staking.sol#1196) is not in mixedCase
Parameter FarmProRata.transferAnyOldERC20Token(address,address,uint256)._amount
(Staking.sol#1196) is not in mixedCase
Constant FarmProRata.trustedDepositTokenAddress (Staking.sol#775) is not in
UPPER_CASE_WITH_UNDERSCORES
Constant FarmProRata.trustedRewardTokenAddress (Staking.sol#776) is not in
UPPER_CASE_WITH_UNDERSCORES
Constant FarmProRata.cliffTime (Staking.sol#782) is not in
UPPER_CASE_WITH_UNDERSCORES
Constant FarmProRata.disburseAmount (Staking.sol#785) is not in
UPPER_CASE_WITH_UNDERSCORES
Constant FarmProRata.disburseDuration (Staking.sol#787) is not in
UPPER_CASE_WITH_UNDERSCORES
Constant FarmProRata.adminCanClaimAfter (Staking.sol#791) is not in
UPPER_CASE_WITH_UNDERSCORES
Constant FarmProRata.swapAttemptPeriod (Staking.sol#794) is not in
UPPER_CASE_WITH_UNDERSCORES
Constant FarmProRata.burnOrDisburseTokensPeriod (Staking.sol#796) is not in
UPPER_CASE_WITH_UNDERSCORES
Constant FarmProRata.disbursePercentX100 (Staking.sol#801) is not in
UPPER_CASE_WITH_UNDERSCORES
Variable FarmProRata.SWAP_PATH (Staking.sol#818) is not in mixedCase
Constant FarmProRata.pointMultiplier (Staking.sol#854) is not in
UPPER_CASE_WITH_UNDERSCORES
Reference: https://github.com/crytic/slither/wiki/Detector-
Documentation#conformance-to-solidity-naming-conventions
INFO:Detectors:
FarmProRata.slitherConstructorConstantVariables() (Staking.sol#752-1203) uses
literals with too many digits:
        - BURN_ADDRESS = 0x000000000000000000000000000000000000dEaD
(Staking.sol#779)
```

```
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#too-many-
digits
INFO:Detectors:
transferOwnership(address) should be declared external:
        - Ownable.transferOwnership(address) (Staking.sol#495-499)
addContractBalance(uint256) should be declared external:
        - FarmProRata.addContractBalance(uint256) (Staking.sol#857-860)
getNumberOfHolders() should be declared external:
        - FarmProRata.getNumberOfHolders() (Staking.sol#918-920)
deposit(uint256) should be declared external:
        - FarmProRata.deposit(uint256) (Staking.sol#924-938)
withdraw(uint256) should be declared external:
        - FarmProRata.withdraw(uint256) (Staking.sol#941-957)
emergencyWithdraw(uint256) should be declared external:
        - FarmProRata.emergencyWithdraw(uint256) (Staking.sol#960-981)
claim() should be declared external:
        - FarmProRata.claim() (Staking.sol#984-986)
disburseRewardTokens() should be declared external:
        - FarmProRata.disburseRewardTokens() (Staking.sol#1094-1116)
burnRewardTokens() should be declared external:
        - FarmProRata.burnRewardTokens() (Staking.sol#1120-1125)
getDepositorsList(uint256,uint256) should be declared external:
        - FarmProRata.getDepositorsList(uint256,uint256) (Staking.sol#1160-1185)
transferAnyERC20Token(address,address,uint256) should be declared external:
        - FarmProRata.transferAnyERC20Token(address,address,uint256)
(Staking.sol#1189-1193)
transferAnyOldERC20Token(address,address,uint256) should be declared external:
        - FarmProRata.transferAnyOldERC20Token(address,address,uint256)
(Staking.sol#1196-1202)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#public-
function-that-could-be-declared-external
INFO:Slither:Staking.sol analyzed (10 contracts with 46 detectors), 78 result(s)
found
INFO:Slither:Use https://crytic.io/ to get access to additional detectors and
Github integration
```

governance.sol:

```
> slither governance.sol

INFO:Detectors:
Reentrancy in Governance.withdrawAllTokens() (governance.sol#418-422):
        External calls:
        -
require(bool,string)(Token(TRUSTED_TOKEN_ADDRESS).transfer(msg.sender,totalDeposit
edTokens[msg.sender]),transfer failed!) (governance.sol#420)
        State variables written after the call(s):
        - totalDepositedTokens[msg.sender] = 0 (governance.sol#421)
Reference: https://github.com/crytic/slither/wiki/Detector-
Documentation#reentrancy-vulnerabilities-1
INFO:Detectors:
Reentrancy in Governance.addVotes(uint256,Governance.Option,uint256)
(governance.sol#368-394):
        External calls:
```

```
        -
require(bool,string)(Token(TRUSTED_TOKEN_ADDRESS).transferFrom(msg.sender,address(
this),amount),transferFrom failed!) (governance.sol#372)
        State variables written after the call(s):
        - lastVotedProposalStartTime[msg.sender] = proposalStartTime[proposalId]
(governance.sol#392)
        - optionOneVotes[proposalId] = optionOneVotes[proposalId].add(amount)
(governance.sol#384)
        - optionTwoVotes[proposalId] = optionTwoVotes[proposalId].add(amount)
(governance.sol#386)
        - totalDepositedTokens[msg.sender] =
totalDepositedTokens[msg.sender].add(amount) (governance.sol#388)
        - votedForOption[msg.sender][proposalId] = option (governance.sol#376)
        - votesForProposalByAddress[msg.sender][proposalId] =
votesForProposalByAddress[msg.sender][proposalId].add(amount) (governance.sol#389)
Reference: https://github.com/crytic/slither/wiki/Detector-
Documentation#reentrancy-vulnerabilities-2
INFO:Detectors:
Governance.addVotes(uint256,Governance.Option,uint256) (governance.sol#368-394)
uses timestamp for comparisons
        Dangerous comparisons:
        - lastVotedProposalStartTime[msg.sender] < proposalStartTime[proposalId]
(governance.sol#391)
Governance.withdrawAllTokens() (governance.sol#418-422) uses timestamp for
comparisons
        Dangerous comparisons:
        - require(bool,string)(now >
lastVotedProposalStartTime[msg.sender].add(VOTE_DURATION),Tokens are still in
voting!) (governance.sol#419)
Governance.isProposalOpen(uint256) (governance.sol#463-468) uses timestamp for
comparisons
        Dangerous comparisons:
        - now < proposalStartTime[proposalId].add(VOTE_DURATION)
(governance.sol#464)
Governance.isProposalExecutible(uint256) (governance.sol#473-480) uses timestamp
for comparisons
        Dangerous comparisons:
        - (! isProposalOpen(proposalId)) && (now <
proposalStartTime[proposalId].add(VOTE_DURATION).add(RESULT_EXECUTION_ALLOWANCE_PE
RIOD)) && ! isProposalExecuted[proposalId] (governance.sol#474-476)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#block-
timestamp
INFO:Detectors:
Address.isContract(address) (governance.sol#55-64) uses assembly
        - INLINE ASM (governance.sol#62)
Address._verifyCallResult(bool,bytes,string) (governance.sol#200-217) uses
assembly
        - INLINE ASM (governance.sol#209-212)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#assembly-
usage
INFO:Detectors:
Low level call in Address.sendValue(address,uint256) (governance.sol#82-88):
        - (success) = recipient.call{value: amount}() (governance.sol#86)
Low level call in Address.functionCallWithValue(address,bytes,uint256,string)
(governance.sol#143-150):
        - (success,returndata) = target.call{value: value}(data)
(governance.sol#148)
Low level call in Address.functionStaticCall(address,bytes,string)
(governance.sol#168-174):
```

```
        - (success,returndata) = target.staticcall(data) (governance.sol#172)
Low level call in Address.functionDelegateCall(address,bytes,string)
(governance.sol#192-198):
        - (success,returndata) = target.delegatecall(data) (governance.sol#196)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#low-
level-calls
INFO:Slither:governance.sol analyzed (5 contracts with 46 detectors), 12 result(s)
found
INFO:Slither:Use https://crytic.io/ to get access to additional detectors and
Github integration
```