SCRL

Full Audit Report

Hater Coin Security Assessment

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FULL AUDIT REPORT

Security Assessment by SCRL on **Friday, September 1, 2023**

SCRL is deliver a security solution for Web3 projects by expert security researchers.

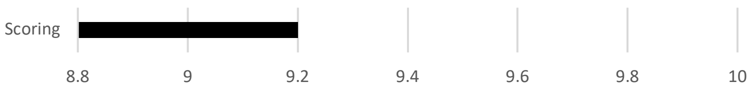
Executive Summary

For this security assessment, SCRL received a request on Friday, September 1, 2023

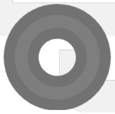
Client	Language	Audit Method	Confidential	Network Chain	Contract
Hater Coin	**Solidity**	**Whitebox**	**Public**	**Ethereum**	**0x00DD7A1B9FCf2811279D260C71d1b5bCB6374f2B**

Report Version	Twitter	Telegram	Website
1.0	**https://twitter.com/hatercoinmoon**	**https://t.me/RealHatercoin**	**https://hater-coin.com/**

CVSS Scoring:



Vulnerability Summary



2	2	0	0	2	0
Total Findings	Unresolved	Resolved	Mitigate	Acknowledge	Decline

■	0	**Critical**		Critical severity is assigned to security vulnerabilities that pose a severe threat to the smart contract and the entire blockchain ecosystem.
■	0	**High**		High-severity issues should be addressed quickly to reduce the risk of exploitation and protect users' funds and data.
■	0	**Medium**		It's essential to fix medium-severity issues in a reasonable timeframe to enhance the overall security of the smart contract.
■	0	**Low**		While low-severity issues can be less urgent, it's still advisable to address them to improve the overall security posture of the smart contract.
■	0	**Very Low**		Very Low severity is used for minor security concerns that have minimal impact and are generally of low risk.
■	1	**Informational**	**1 Unresolved**	Used to categorize security findings that do not pose a direct security threat to the smart contract or its users. Instead, these findings provide additional information, recommendations
■	1	**Gas-optimization**	**1 Unresolved**	Suggestions for more efficient algorithms or improvements in gas usage, even if the current code is already secure.

Audit Scope:

File	SHA-1 Hash
contracts/Hatercoin.sol	7ed5caf6dff74979dbd1a684711196f905eb15cb

Audit Version History:

Version	Date	Description
1.0	Friday, September 1, 2023	Preliminary Report
1.1	Saturday, September 2, 2023	Full Audit Report

Audit information:

Request Date	Audit Date	Re-assessment Date
Friday, 1 September R 2023	Friday, September 1, 2023	-

Smart Contract Audit Summary

SCRL
SCRL has assessed
the security of this smart contract.
The results of the security
assessment revealed
No Critical Vulnerabilities.
Full Audit Report by SCRL on September 2, 2023

Security Assessment Author

Auditor:	**Mark K.**	[Security Researcher | Redteam]
	Kevin N.	[Security Researcher | Web3 Dev]
	Yusheng T.	[Security Researcher | Incident Response]
Document Approval:	**Ronny C.**	CTO & Head of Security Researcher
	Chinnakit J.	CEO & Founder

Digital Sign

Digitally signed by Chinnakit J.
DN: cn=Chinnakit J., o=SCRL,
ou=CEO & Founder,
email=contact@scrl.io, c=TH
Date: 2023.09.02 12:19:28
+07'00'

SECURI LAB rebranded to SCRL

Disclaimer

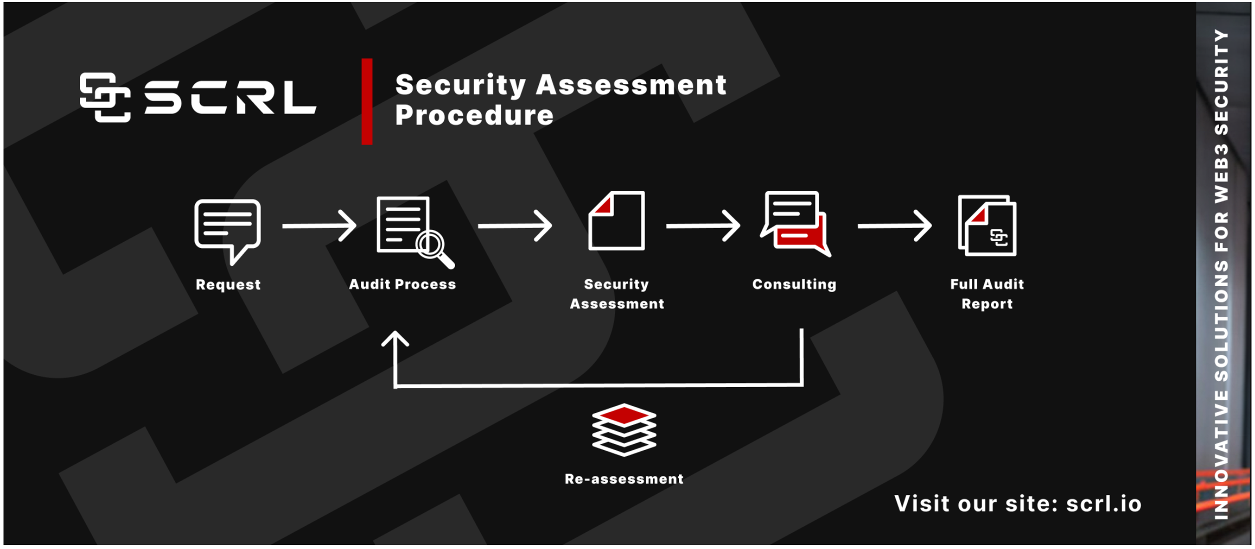
Regarding this security assessment, there are no guarantees about the security of the program instruction received from the client is hereinafter referred to as “**Source code**”.
And **SCRL** hereinafter referred to as “**Service Provider**”, the **Service Provider** will not be held liable for any legal liability arising from errors in the security assessment. The responsibility will be the responsibility of the **Client**, hereinafter referred to as “**Service User**” and the
Service User agrees not to be held liable to the **service provider** in any case. By contract
Service Provider to conduct security assessments with integrity with professional ethics, and transparency to deliver security assessments to users The **Service Provider** has the right to postpone the delivery of the security assessment. If the security assessment is delayed whether caused by any reason and is not responsible for any delayed security assessments.
If **the service provider** finds a vulnerability The **service provider** will notify the **service user** via the Preliminary Report, which will be kept confidential for security. The **service provider** disclaims responsibility in the event of any attacks occurring whether before conducting a security assessment. Or happened later All responsibility shall be sole with the **service user**.

Security Assessment Is Not Financial/Investment Advice Any loss arising from any investment in any project is the responsibility of the investor.

SCRL disclaims any liability incurred. Whether it's Rugpull, Abandonment, Soft Rugpull, Exploit, Exit Scam.

Security Assessment Procedure

1. **Request** The client must submit a formal request and follow the procedure. By submitting the source code and agreeing to the terms of service.
2. **Audit Process** Check for vulnerabilities and vulnerabilities from source code obtained by experts using formal verification methods, including using powerful tools such as Static Analysis, SWC Registry, Dynamic Security Analysis, Automated Security Tools, CWE, Syntax & Parameter Check with AI ,WAS (Warning Avoidance System a python script tools powered by SCRL).
3. **Security Assessment** Deliver Preliminary Security Assessment to clients to acknowledge the risks and vulnerabilities.
4. **Consulting** Discuss on risks and vulnerabilities encountered by clients to apply to their source code to mitigate risks.
    a. **Re-assessment** Reassess the security when the client implements the source code improvements and if the client is satisfied with the results of the audit. We will proceed to the next step.
5. **Full Audit Report** SCRL provides clients with official security assessment reports informing them of risks and vulnerabilities. Officially and it is assumed that the client has been informed of all the information.



Risk Rating

Risk rating using this commonly defined: $Risk\ rating\ =\ impact\ *\ confidence$

Impact The severity and potential impact of an attacker attack

Confidence Ensuring that attackers expose and use this vulnerability

Confidence Impact [Likelihood]	Low	Medium	High
Low	**Very Low**	**Low**	**Medium**
Medium	**Low**	**Medium**	**High**
High	**Medium**	**High**	**Critical**

Severity is a risk assessment It is calculated from the Impact and Confidence values using the following calculation methods,

$Risk\ rating\ =\ impact\ *\ confidence$

It is categorized into

7 categories severity based

Gas-optimization | Informational | Very Low | Low | Medium | High | Critical

For **Informational** & **Non-class/Optimization/Best-practices will** <u>not be counted</u> as **severity**

Category

Centralization

Centralization Risk is The risk incurred by a sole proprietor, such as the Owner being able to change something without permission

Economics Risk

Economics Risk is Risks that may affect the economic mechanism system, such as the ability to increase Mint token

Logical Issue

Logical Issue is that can cause errors to core processing, such as any prior operations that cause background processes to crash.

Authorization

Authorization is Possible pitfalls from weak coding allows unrelated people to take any action to modify the values.

Mathematical

Mathematical Any erroneous arithmetic operations affect the operation of the system or lead to erroneous values.

Naming Conventions

Naming Conventions naming variables that may affect code understanding or naming inconsistencies

Security Risk

Security Risk of loss or damage if it's no mitigate

Coding Style

Coding Style is Tips coding for efficiency performance

Best Practices

Best Practices is suggestions for improvement

Optimization

Optimization is performance improvement

Gas Optimization

Gas Optimization is increase performance to avoid expensive gas

Dead Code

Dead Code having unused code This may result in wasted resources and gas fees.

Table Of Content

Summary

Source Code Detail

Vulnerability Finding

About SCRL

Source Code Detail

Source Units Analyzed: `1`
Source Units in Scope: `1` (**100%**)

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
📝📚	contracts/Hatercoin.sol	2		161	150	117	9	67	
📝📚	**Totals**	**2**		**161**	**150**	**117**	**9**	**67**	

Legend: [▬]

- **Lines**: total lines of the source unit
- **nLines**: normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
- **nSLOC**: normalized source lines of code (only source-code lines; no comments, no blank lines)
- **Comment Lines**: lines containing single or block comments
- **Complexity Score**: a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

Visibility, Mutability, Modifier function testing

Components

📝Contracts	📚Libraries	🔍Interfaces	🎨Abstract
1	1	0	0

Exposed Functions

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.

🌐Public	💰Payable
7	0

External	Internal	Private	Pure	View
7	9	0	3	2

StateVariables

Total	🌐Public
9	6

Capabilities

Solidity Versions observed	🧪 Experimental Features	💰 Can Receive Funds	🖥 Uses Assembly	💣 Has Destroyable Contracts
`0.8.18`				

📤 Transfers ETH	⚡ Low-Level Calls	👥 DelegateCall	🧮 Uses Hash Functions	🔖 ECRecover	🌀 New/Create/Create2

♻️ TryCatch	Σ Unchecked

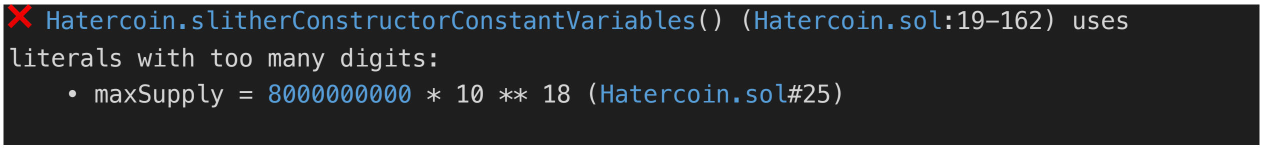
Vulnerability Findings

ID	Vulnerability Detail	Severity	Category	Status
SEC-01	Conformance to numeric notation best practices (too-many-digits)	Informational	Best Practices	**Acknowledge**
GAS-01	Use Custom Errors	Gas-optimization	Gas Optimization	**Acknowledge**

SEC-01: Conformance to numeric notation best practices (too-many-digits)

Vulnerability Detail	Severity	Location	Category	Status
Conformance to numeric notation best practices (too-many-digits)	Informational	Check on finding	Best Practices	**Acknowledge**

Finding:



```
❌ Hatercoin.slitherConstructorConstantVariables() (Hatercoin.sol:19-162) uses
literals with too many digits:
    • maxSupply = 8000000000 * 10 ** 18 (Hatercoin.sol#25)
```

Recommendation:
Use:
- [Ether suffix](https://solidity.readthedocs.io/en/latest/units-and-global-variables.html#ether-units),
- [Time suffix](https://solidity.readthedocs.io/en/latest/units-and-global-variables.html#time-units), or
- [The scientific notation](https://solidity.readthedocs.io/en/latest/types.html#rational-and-integer-literals)

Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#too-many-digits

Alleviation:
Hater Coin Team has acknowledge this issue.

GAS-01: Use Custom Errors

Vulnerability Detail	Severity	Location	Category	Status
Use Custom Errors	-	Check on finding	Gas Optimization	**Acknowledge**

Finding:

```
File: Hatercoin.sol

58:       require(!locked, "Reentrant call");

95:       require(senderBalance >= amount, "Insufficient balance for burning");

118:        require(amount <= balances[sender], "Insufficient balance");

119:        require(amount <= allowances[sender][msg.sender], "Allowance exceeded");

136:        require(recipients.length == amounts.length, "Invalid input length");
```

Recommendation:

Instead of using error strings, to reduce deployment and runtime cost, you should use Custom Errors. This would save both deployment and runtime cost.

[Source](https://blog.soliditylang.org/2021/04/21/custom-errors/)

Alleviation:

Hater Coin Team has acknowledge this issue.

SWC Findings

ID	Title	Scanning	Result
SWC-100	Function Default Visibility	Complete	No risk
SWC-101	Integer Overflow and Underflow	Complete	No risk
SWC-102	Outdated Compiler Version	Complete	No risk
SWC-103	Floating Pragma	Complete	No risk
SWC-104	Unchecked Call Return Value	Complete	No risk
SWC-105	Unprotected Ether Withdrawal	Complete	No risk
SWC-106	Unprotected SELFDESTRUCT Instruction	Complete	No risk
SWC-107	Reentrancy	Complete	No risk
SWC-108	State Variable Default Visibility	Complete	No risk
SWC-109	Uninitialized Storage Pointer	Complete	No risk
SWC-110	Assert Violation	Complete	No risk
SWC-111	Use of Deprecated Solidity Functions	Complete	No risk
SWC-112	Delegatecall to Untrusted Callee	Complete	No risk
SWC-113	DoS with Failed Call	Complete	No risk
SWC-114	Transaction Order Dependence	Complete	No risk
SWC-115	Authorization through tx.origin	Complete	No risk

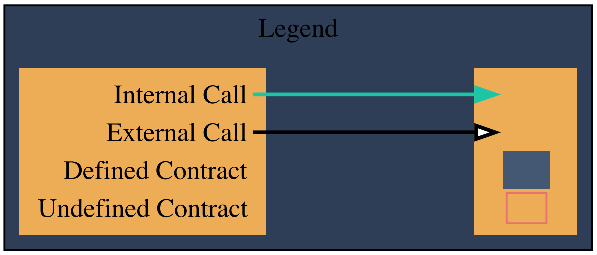
SWC-116	Block values as a proxy for time	Complete	No risk
SWC-117	Signature Malleability	Complete	No risk
SWC-118	Incorrect Constructor Name	Complete	No risk
SWC-119	Shadowing State Variables	Complete	No risk
SWC-120	Weak Sources of Randomness from Chain Attributes	Complete	No risk
SWC-121	Missing Protection against Signature Replay Attacks	Complete	No risk
SWC-122	Lack of Proper Signature Verification	Complete	No risk
SWC-123	Requirement Violation	Complete	No risk
SWC-124	Write to Arbitrary Storage Location	Complete	No risk
SWC-125	Incorrect Inheritance Order	Complete	No risk
SWC-126	Insufficient Gas Griefing	Complete	No risk
SWC-127	Arbitrary Jump with Function Type Variable	Complete	No risk
SWC-128	DoS With Block Gas Limit	Complete	No risk
SWC-129	Typographical Error	Complete	No risk
SWC-130	Right-To-Left-Override control character (U+202E)	Complete	No risk
SWC-131	Presence of unused variables	Complete	No risk
SWC-132	Unexpected Ether balance	Complete	No risk

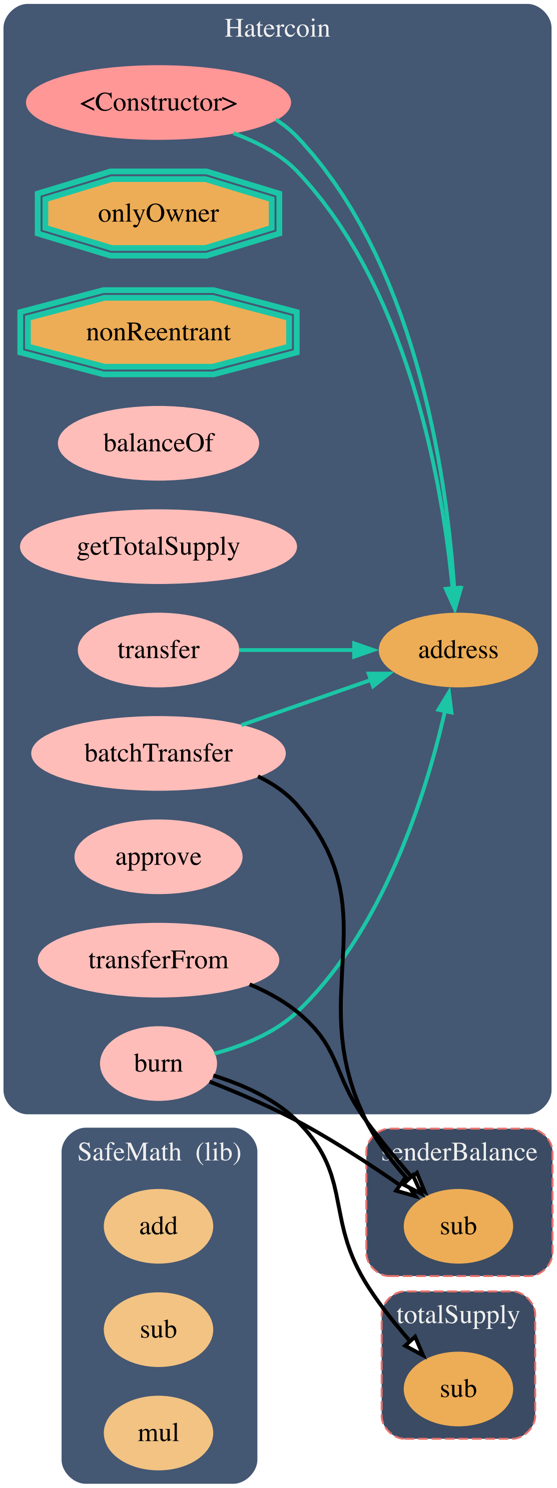
SWC-133	Hash Collisions With Multiple Variable Length Arguments	Complete	No risk
SWC-134	Message call with hardcoded gas amount	Complete	No risk
SWC-135	Code With No Effects	Complete	No risk
SWC-136	Unencrypted Private Data On-Chain	Complete	No risk

Contracts Description Table

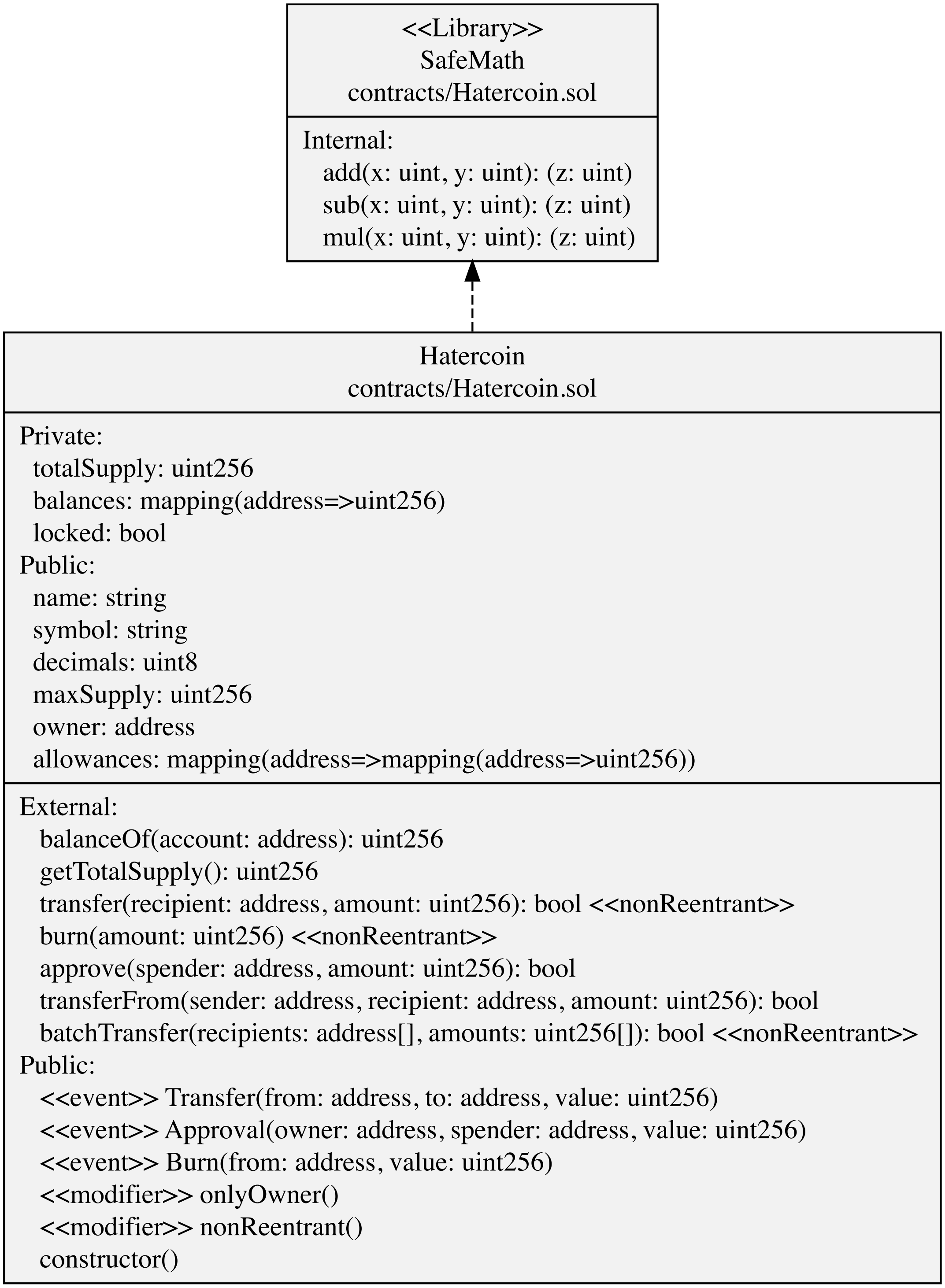
Contract	**Type**	**Bases**		
└	**Function Name**	**Visibility**	**Mutability**	**Modifiers**
SafeMath	Library			
└	add	Internal 🔒		
└	sub	Internal 🔒		
└	mul	Internal 🔒		
Hatercoin	Implementation			
└		Public ❗	🛑	NO❗
└	balanceOf	External ❗		NO❗
└	getTotalSupply	External ❗		NO❗
└	transfer	External ❗	🛑	nonReentrant
└	burn	External ❗	🛑	nonReentrant
└	approve	External ❗	🛑	NO❗
└	transferFrom	External ❗	🛑	NO❗
└	batchTransfer	External ❗	🛑	nonReentrant

Inheritate Function Relation Graph





UML Class Diagram



<<Library>>
SafeMath
contracts/Hatercoin.sol

Internal:
add(x: uint, y: uint): (z: uint)
sub(x: uint, y: uint): (z: uint)
mul(x: uint, y: uint): (z: uint)

Hatercoin
contracts/Hatercoin.sol

Private:
totalSupply: uint256
balances: mapping(address=>uint256)
locked: bool
Public:
name: string
symbol: string
decimals: uint8
maxSupply: uint256
owner: address
allowances: mapping(address=>mapping(address=>uint256))

External:
balanceOf(account: address): uint256
getTotalSupply(): uint256
transfer(recipient: address, amount: uint256): bool <<nonReentrant>>
burn(amount: uint256) <<nonReentrant>>
approve(spender: address, amount: uint256): bool
transferFrom(sender: address, recipient: address, amount: uint256): bool
batchTransfer(recipients: address[], amounts: uint256[]): bool <<nonReentrant>>
Public:
<<event>> Transfer(from: address, to: address, value: uint256)
<<event>> Approval(owner: address, spender: address, value: uint256)
<<event>> Burn(from: address, value: uint256)
<<modifier>> onlyOwner()
<<modifier>> nonReentrant()
constructor()

About SCRL

SCRL (Previously name SECURI LAB) was established in 2020, and its goal is to deliver a security solution for Web3 projects by expert security researchers. To verify the security of smart contracts, they have developed internal tools and KYC solutions for Web3 projects using industry-standard technology. SCRL was created to solve security problems for Web3 projects. They focus on technology for conciseness in security auditing. They have developed Python-based tools for their internal use called WAS and SCRL. Their goal is to drive the crypto industry in Thailand to grow with security protection technology.

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