

# SMART CONTRACT SECURITY AUDIT OF JOKER INU



SMART CONTRACT AUDIT | SOLIDITY DEVELOPMENT & TESTING | PROJECT EVALUATION

RELENTLESSLY SECURING THE PUBLIC BLOCKCHAIN



## **Audit Introduction**

**Auditing Firm** InterFi Network

**Audit Architecture** InterFi Echelon Auditing Standard

**Language** Solidity

Client Firm Joker Inu

Website <a href="https://www.jokerinu.io/">https://www.jokerinu.io/</a>

Telegram <a href="https://t.me/jokerinuportal/">https://t.me/jokerinuportal/</a>

Twitter <a href="https://twitter.com/jokerinu\_/">https://twitter.com/jokerinu\_/</a>

Report Date March 21, 2022

#### **About Joker Inu**

Joker Inu is the ultimate hybrid token combining meme and utility. It's the safe and fun investment you've been looking for. Join our weekly raffle, earn prizes, have fun, and be part of a development process aiming to revolutionize the crypto world.



# **Audit Summary**

InterFi team has performed a line-by-line manual analysis and automated review of the smart contract. The smart contract was analyzed mainly for common smart contract vulnerabilities, exploits, and manipulation hacks. According to the smart contract audit:

- ❖ Joker Inu's solidity source code has LOW RISK SEVERITY
- ❖ Joker Inu's smart contract has an ACTIVE OWNERSHIP
- Joker Inu's centralization risk correlated to the active owner is HIGH
- Important owner privileges BLACKLIST, UPDATE COOLDOWN, MAX TRANSACTION & WALLET LIMIT, SET FEES, CHANGE TRADING STATUS

Be aware that smart contracts deployed on the blockchain aren't resistant to internal exploit, external vulnerability, or hack. For a detailed understanding of risk severity, source code vulnerability, exploitability, and audit disclaimer, kindly refer to the audit.

- Contract address: Not deployed Complete Complete
- 🖁 Blockchain: **Not chained**
- ✓ Verify the authenticity of this report on InterFi's GitHub: <a href="https://github.com/interfinetwork">https://github.com/interfinetwork</a>



# **Table Of Contents**

## **Audit Information**

Audit Scope	5
Echelon Audit Standard	
Audit Methodology	6
Risk Classification	8
Centralization Risk	9
Smart Contract Risk Assessment	
Static Analysis	
Software Analysis	13
Manual Analysis	15
SWC Attacks	19
Risk Status & Radar Chart	
<u>Audit Summary</u>	
Auditor's Verdict	22
<u>Legal Advisory</u>	
Important Disclaimer	23
About InterFi Network	24



# **Audit Scope**

InterFi was consulted by Joker Inu to conduct the smart contract security audit of their solidity source code. The audit scope of work is strictly limited to the mentioned solidity file(s) only:

Jokerlnu.sol

### Solidity Source Code On InterFi GitHub

https://github.com/interfinetwork/audited-codes/blob/main/JokerInu.sol

#### SHA-1 Hash

Solidity source code is audited at hash #560dc2266114a1bc36633de60b7a551b00347479

Smart Contract Security Audit



# **Audit Methodology**

The scope of this report is to audit the smart contract source code of Joker Inu. InterFi has scanned the contract and reviewed the project for common vulnerabilities, exploits, hacks, and back-doors. Due to being out of scope, InterFi has not tested the contract on testnet to assess any functional flaws. Below is the list of commonly known smart contract vulnerabilities, exploits, and hacks:

#### Category

Re-en	trancy
-------	--------

- Unhandled Exceptions
- Transaction Order Dependency
- Integer Overflow
- Unrestricted Action
- Incorrect Inheritance Order
- Typographical Errors
- Requirement Violation
- Gas Limit and Loops
- Deployment Consistency
- Repository Consistency
- Data Consistency
- Token Supply Manipulation
- Access Control and Authorization
- Operations Trail and Event Generation
- Assets Manipulation
- Ownership Control
- Liquidity Access

#### **Smart Contract Vulnerabilities**

#### **Source Code Review**



#### InterFi's Echelon Audit Standard

The aim of InterFi's "Echelon" standard is to analyze the smart contract and identify the vulnerabilities and the hacks in the smart contract. <u>Kindly note, InterFi does not test the smart contract on testnet</u>. It is recommended that the smart contract is thoroughly tested prior to the <u>audit submission</u>. Mentioned are the steps used by InterFi to audit the smart contract:

- 1. Solidity smart contract source code reviewal:
  - \* Review of the specifications, sources, and instructions provided to InterFi to make sure we understand the size, and scope of the smart contract audit.
  - Manual review of code, which is the process of reading source code line-by-line to identify potential vulnerabilities.
- 2. Static, Manual, and Software analysis:
  - \* Test coverage analysis is the process of determining whether the test cases are covering the code and how much code is exercised when we run those test cases.
  - Symbolic execution is analyzing a program to determine what inputs cause each part of a program to execute.
    Smort Contract
- 3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
- 4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts

#### <u>Automated 3P frameworks used to assess the smart contract vulnerabilities</u>

- Consensys Tools
- SWC Registry
- Solidity Coverage
- Open Zeppelin Code Analyzer
- Solidity Code Complier



## **Risk Classification**

Smart contracts are generally designed to manipulate and hold funds denominated in ETH/BNB. This makes them very tempting attack targets, as a successful attack may allow the attacker to directly steal funds from the contract. Below are the typical risk levels of a smart contract:

**Vulnerable**: A contract is vulnerable if it has been flagged by a static analysis tool as such. As we will see later, this means that some contracts may be vulnerable because of a false positive.

**Exploitable:** A contract is exploitable if it is vulnerable and the vulnerability could be exploited by an external attacker. For example, if the "vulnerability" flagged by a tool is in a function that requires owning the contract, it would be vulnerable but not exploitable.

**Exploited:** A contract is exploited if it received a transaction on the main network which triggered one of its vulnerabilities. Therefore, a contract can be vulnerable or even exploitable without having been exploited.

STRUCT SOLICITIES	
Risk severity	Meaning Security Audit
	This level vulnerabilities could be exploited easily and can lead to asset loss,
! High	data loss, asset, or data manipulation. They should be fixed right away.
! Medium	This level vulnerabilities are hard to exploit but very important to fix, they carry
	an elevated risk of smart contract manipulation, which can lead to high-risk
	severity
	This level vulnerabilities should be fixed, as they carry an inherent risk of future
! Low	exploits, and hacks which may or may not impact the smart contract execution.
! Informational	This level vulnerabilities can be ignored. They are code style violations and
	informational statements in the code. They may not affect the smart contract
	execution



## **Centralization Risk**

Centralization risk is the most common cause of decentralized finance hacks. When a smart contract has an active contract ownership, the risk related to centralization is elevated. There are some well-intended reasons to be an active contract owner, such as:

- Contract owner can be granted the power to pause() or lock() the contract in case of an external attack.
- Contract owner can use functions like, include(), and exclude() to add or remove wallets from fees, swap checks, and transaction limits. This is useful to run a presale, and to list on an exchange.

Authorizing a full centralized power to a single body can be dangerous. Unfortunately, centralization related risks are higher than common smart contract vulnerabilities. Centralization of ownership creates a risk of rug pull scams, where owners cash out tokens in such quantities that they become valueless. **Most important question to ask here is, how to mitigate centralization risk?** Here's InterFi's recommendation to lower the risks related to centralization hacks:

- Smart contract owner's private key must be carefully secured to avoid any potential hack.
- Smart contract ownership should be shared by multi-signature (multi-sig) wallets.
- Smart contract ownership can be locked in a contract, user voting, or community DAO can be introduced to unlock the ownership.

#### **Joker Inu's Centralization Status**

- Joker Inu's smart contract has an active ownership.
- Joker Inu's smart contract is not deployed on blockchain at the time of the audit.



# **Static Analysis**

## **Symbol** Meaning Function can modify state Function is payable S Function is locked Function can be accessed Important functionality | \*\*Context\*\* | Implementation | ||| | \*\*IERC20\*\* | Interface | ||| | L | totalSupply | External ! | NO! | | L | balanceOf | External ! | |N0 ! | | L | transfer | External ! | P | NO! | | <sup>L</sup> | allowance | External ! | | L | transferFrom | External ! | • | NO! | | \*\*IERC20Metadata\*\* | Interface | IERC20 ||| | L | name | External ! | NO! | | L | symbol | External ! | NO! | | L | decimals | External ! | NO! | | \*\*ERC20\*\* | Implementation | Context, IERC20, IERC20Metadata ||| | L | <Constructor> | Public ! | • | NO! | | L | name | Public ! | NO! | | L | symbol | Public ! | NO! | | L | decimals | Public ! | NO! | | L | totalSupply | Public ! | NO! | | L | balanceOf | Public ! | NO! | | L | transfer | Public ! | 🛑 |NO! | | L | allowance | Public ! | NO! | | L | approve | Public ! | 🛑 |NO! | | L | transferFrom | Public ! | 🔎 |NO! | | L | increaseAllowance | Public ! | • | NO! | | L | decreaseAllowance | Public ! | • | NO! | | L | \_transfer | Internal 🗎 | 🛑 | |



```
| L | _tokengeneration | Internal 🗎 | 🛑 | |
| └ | _approve | Internal 🔒 | 🔴 | |
| └ | _beforeTokenTransfer | Internal 🗎 | ● | |
| **Address** | Library | |||
| L | sendValue | Internal 🗎 | 🛑 | |
IIIIIII
| **<mark>Ownable</mark>** | Implementation | Context |||
| └ | <Constructor> | Public ! | ● |NO! |
| <sup>L</sup> | owner | Public ! |
                         |NO! |
| └ | renounceOwnership | Public ! | ● | onlyOwner |
| L | transferOwnership | Public ! | 📦 | onlyOwner |
| L | _setOwner | Private 🗎 | 🔎 | |
| **IFactory** | Interface | |||
| L | createPair | External ! | 🔴 |NO! |
| **IRouter** | Interface | |||
| L | factory | External ! | NO! |
| L | WETH | External ! | NO! |
| L | addLiquidityETH | External ! | 💹 |NO! |
| L | swapExactTokensForETHSupportingFeeOnTransferTokens | External ! | 🛑 | NO! |
111111
| **Jokerinu** | Implementation | ERC20, Ownable ||| |
| L | approve | Public ! | • NO! |
| L | transferFrom | Public ! | 🔎 |NO! |
| L | increaseAllowance | Public ! | • | NO! |
| L | decreaseAllowance | Public ! | • | NO! |
| L | transfer | Public ! | 🔴 |NO! |
| └ | _transfer | Internal 🗎 | ● | |
| L | handle_fees | Private 🔐 | 🛑 | mutexLock |
| └ | swapTokensForETH | Private 🔐 | 🛑 | |
| L | addLiquidity | Private 🔐 | 🛑 | |
| L | updateLiquidityProvide | External ! | PolyOwner |
| L | updateLiquidityTreshhold | External ! | OnlyOwner |
| └ | updateTaxes | External ! | ● | onlyOwner |
| L | updateSellTaxes | External ! | • | onlyOwner |
| └ | updateRouterAndPair | External ! | ● | onlyOwner |
| L | updateTradingEnabled | External ! | • | onlyOwner |
| L | updateMarketingWallet | External ! | 🔎 | onlyOwner |
| └ | updateRaffleWallet | External ! | ● | onlyOwner |
| L | updateDevWallet | External ! | 🔴 | onlyOwner |
| L | updateOpsWallet | External ! | 🔎 | onlyOwner |
| L | updateCooldown | External ! | • | onlyOwner |
| L | updateIsBlacklisted | External ! | 🔴 | onlyOwner |
| L | bulkIsBlacklisted | External ! | 🔎 | onlyOwner |
| └ | updateAllowedTransfer | External ! | ● | onlyOwner |
| L | bulkAllowedTransfer | External ! | Government | Language | OnlyOwner |
```



# Interfi

Smart Contract Security Audit



# **Software Analysis**

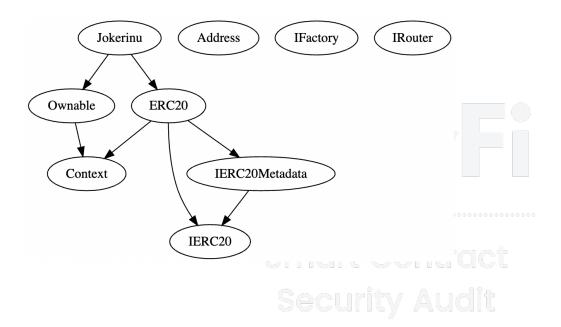
#### **Function Signatures**

```
39509351 => increaseAllowance(address,uint256)
119df25f => msgSender()
8b49d47e \Rightarrow msqData()
18160ddd => totalSupply()
70a08231 => balanceOf(address)
a9059cbb => transfer(address,uint256)
dd62ed3e => allowance(address,address)
095ea7b3 => approve(address,uint256)
23b872dd => transferFrom(address,address,uint256)
06fdde03 => name()
95d89b41 => symbol()
313ce567 \Rightarrow decimals()
a457c2d7 => decreaseAllowance(address,uint256)
30e0789e => transfer(address,address,uint256)
c143c0de => _tokengeneration(address,uint256)
6161eb18 => _burn(address,uint256)
104e81ff => _approve(address,address,uint256)
cad3be83 => _beforeTokenTransfer(address,address,uint256)
24a084df => sendValue(address,uint256)
8da5cb5b => owner()
715018a6 => renounceOwnership()
f2fde38b => transfer0wnership(address)
fc201122 => setOwner(address)
c9c65396 => createPair(address,address)
c45a0155 => factory()
ad5c4648 \Rightarrow WETH()
f305d719 => addLiquidityETH(address,uint256,uint256,uint256,address,uint256)
791ac947 =>
swapExactTokensForETHSupportingFeeOnTransferTokens(uint256,uint256,address[],address,uint256)
cd7a9c18 => handle fees(uint256,Taxes)
e56a645e => swapTokensForETH(uint256)
9cd441da => addLiquidity(uint256,uint256)
1340538f => updateLiquidityProvide(bool)
42b6fa11 => updateLiquidityTreshhold(uint256)
c4c2ff4f => updateTaxes(Taxes)
ddd8489e => updateSellTaxes(Taxes)
40b28c2f =>
             updateRouterAndPair(address,address)
3d30d20b =>
             updateTradingEnabled(bool,uint256,uint256)
             updateMarketingWallet(address)
aacebbe3 =>
d189e6e1 =>
             updateRaffleWallet(address)
1816467f =>
             updateDevWallet(address)
1c3909e6 => updateOpsWallet(address)
e517f2b9 => updateCooldown(bool,uint256)
5b24ea5e => updateIsBlacklisted(address,bool)
13f97a8e => bulkIsBlacklisted(address[],bool)
```



b5c57145 => updateAllowedTransfer(address,bool)
81428be1 => bulkAllowedTransfer(address[],bool)
355496ca => updateExemptFee(address,bool)
0e375a5c => bulkExemptFee(address[],bool)
59759f61 => updateMaxTxLimit(uint256,uint256)
d8672e51 => updateMaxWalletlimit(uint256)
9e252f00 => rescueETH(uint256)
8cd4426d => rescueERC20(address,uint256)

### **Inheritance Graph**





# **Manual Analysis**

Function	Description	Available	Status
Total Supply	provides information about the total token		Passed
	supply	Yes	
Delemas Of	provides account balance of the owner's	Yes	Passed
Balance Of	account		
Turn of a v	executes transfers of a specified number of	Yes	Passed
Transfer	tokens to a specified address		
	allow a spender to withdraw a set number of		Passed
Approve	tokens from a specified account	Yes	
	returns a set number of tokens from a spender to		
Allowance	the owner	Yes	Passed
	is an action in which the project buys back its		
Buy Back	tokens from the existing holders usually at a	NA	NA
	market price and the Contract		
	executes transfers of a specified number of	NA	NA
Burn	tokens to a burn address		
	executes the creation of a specified number of		
Mint	tokens and adds it to the total supply	NA	NA
	circulating token supply adjusts (increases or		
Rebase	decreases) automatically according to a token's	NA	NA
	price fluctuations		
	executes transfers of a specified dividend token	NA	NA
Dividend	to a specified address		
	stops or locks all function modules of the smart		
Lock	contract	NA	NA



Function	Description	Tested	Verdict
Blacklist	stops specified wallets from interacting with the smart contract function modules	Yes	! Low
Airdrop	executes transfers of a specified number of tokens to a specified address	NA	NA
Max Transaction	a non-whitelisted wallet can only transfer a specified number of tokens	Yes	! Low
Max Wallet	a non-whitelisted wallet can only hold a specified number of tokens	Yes	! Low
Contract Fees	executes fee collection from swap events and/or transfer events	Yes	! Low
Cooldown Timer	functionality to limit the number of transactions that a wallet can make within 24-hours	Yes	! Low
Anti Bot	stops some or all bot wallets from interacting with the smart contract	Yes	Passed
Anti Snipe	prevents bots from making transaction at "addLiquidity" block	NA	NA
Transfer Ownership	executes transfer of contract ownership to a specified wallet	Yes	Passed
Renounce Ownership	executes transfer of contract ownership to a dead address	Yes	Passed



#### Notable Information

Smart contract owner can switch trading status, this function module may be used to stop the users from buying, selling or transferring assets.

```
function updateTradingEnabled(
   bool state,
```

The smart contract utilizes "SafeMath" function to avoid common smart contract vulnerabilities.

```
string private _name = "JokerInu";
library SafeMath {
function add(uint256 a, uint256 b) internal pure returns (uint256) {
    uint256 c = a + b;
    require(c >= a, "SafeMath: addition overflow");
function sub(uint256 a, uint256 b) internal pure returns (uint256) {
    return sub(a, b, "SafeMath: subtraction overflow");
    uint256 c = a * b;
    require(c / a == b, "SafeMath: multiplication overflow");
    return c;
function div(uint256 a, uint256 b) internal pure returns (uint256) {
    return div(a, b, "SafeMath: division by zero");
function mod(uint256 a, uint256 b) internal pure returns (uint256) {
    return mod(a, b, "SafeMath: modulo by zero");
```

Smart contract owner can blacklist certain wallets from interacting with the contract function modules.

```
function updateIsBlacklisted(address account, bool state) external onlyOwner {
   isBlacklisted[account] = state;
```

- Smart contract owner can change transaction fees. This function module can be used to impose extraordinary fees. No arbitrary limit set.
- Smart contract owner can change max transaction limit. The smart contract owner can change the value to "zero". No arbitrary limit set.

```
function updateMaxTxLimit(uint256 maxBuy, uint256 maxSell) external onlyOwner {
   maxBuyLimit = maxBuy * 10**decimals();
   maxSellLimit = maxSell * 10**decimals();
```



Smart contract owner can change max wallet limit. The smart contract owner can change the value to "zero". No arbitrary limit set.

```
function updateMaxWalletlimit(uint256 amount) external onlyOwner {
   maxWalletLimit = amount * 10**decimals();
```

Smart contract has a low severity issue which may or may not create any functional vulnerability.

```
"severity": 8, (! Low Severity)
```



Smart Contract Security Audit



<sup>&</sup>quot;Expected pragma, import directive or contract/interface/library definition"

# **SWC Attacks**

SWC ID	Description	Status
SWC-101	Integer Overflow and Underflow	Passed
SWC-102	Outdated Compiler Version	! Informational
SWC-103	Floating Pragma	! Low
SWC-104	Unchecked Call Return Value	Passed
SWC-105	Unprotected Ether Withdrawal	Passed
SWC-106	Unprotected SELF-DESTRUCT Instruction	Passed
SWC-107	Re-entrancy	Passed
SWC-108	State Variable Default Visibility	Passed
SWC-109	Uninitialized Storage Pointer	Passed
SWC-110	Assert Violation Smort Contract	Passed
swc-111	Use of Deprecated Solidity Functions	Passed
SWC-112	Delegate Call to Untrusted Callee	Passed
SWC-113	DoS with Failed Call	Passed
SWC-114	Transaction Order Dependence	Passed
SWC-115	Authorization through tx.origin	Passed
SWC-116	Block values as a proxy for time	Passed
SWC-117	Signature Malleability	Passed
SWC-118	Incorrect Constructor Name	Passed



SWC-119	Shadowing State Variables	Passed
SWC-120	Weak Sources of Randomness from Chain Attributes	Passed
SWC-121	Missing Protection against Signature Replay Attacks	Passed
SWC-122	Lack of Proper Signature Verification	Passed
SWC-123	Requirement Violation	Passed
SWC-124	Write to Arbitrary Storage Location	Passed
SWC-125	Incorrect Inheritance Order	Passed
SWC-126	Insufficient Gas Griefing	Passed
SWC-127	Arbitrary Jump with Function Type Variable	Passed
SWC-128	DoS With Block Gas Limit	Passed
SWC-129	Typographical Error	Passed
SWC-130	Right-To-Left-Override control character (U+202E)	Passed
SWC-131	Presence of unused variables  Security Audit	Passed
SWC-132	Unexpected Ether balance	Passed
SWC-133	Hash Collisions With Multiple Variable Length Arguments	Passed
SWC-134	Message call with the hardcoded gas amount	Passed
SWC-135	Code With No Effects (Irrelevant/Dead Code)	Passed
SWC-136	Unencrypted Private Data On-Chain	Passed



# **Risk Status & Radar Chart**

Risk Severity	Status
High	No high severity issues identified
Medium	No medium severity issues identified
Low	6 low severity issues identified
Informational	1 informational severity issues identified
Centralization Risk	High
ļ	Score out of 100 Compiler Check 100 95 Static Analysis Static Analysis

Software Analysis

Manual Analysis



## **Auditor's Verdict**

InterFi team has performed a line-by-line manual analysis and automated review of the smart contract. The smart contract was analyzed mainly for common smart contract vulnerabilities, exploits, and manipulation hacks.

- Joker Inu's smart contract source code has LOW RISK SEVERITY
- Joker Inu's smart contract has an ACTIVE OWNERSHIP
- Joker Inu's centralization risk correlated to the active owner is HIGH



#### **Note for stakeholders**

- Be aware that active smart contract owner privileges constitute an elevated impact on smart contract safety and security.
- If the smart contract is not deployed on any blockchain at the time of the audit, the contract can be modified or altered before blockchain development. Verify contract's deployment status in the audit report.
- ❖ Make sure that the project team's KYC/identity is verified by an independent firm.
- Always check if the contract's liquidity is locked. A longer liquidity lock plays an important role in the project's longevity. It is recommended to have multiple liquidity providers.
- Examine the unlocked token supply in the owner, developer, or team's private wallets.
  Understand the project's tokenomics, and make sure the tokens outside of the LP Pair are vested or locked for a longer period.



## **Important Disclaimer**

InterFi Network provides contract development, testing, auditing and project evaluation services for blockchain projects. The purpose of the audit is to analyze the on-chain smart contract source code and to provide a basic overview of the project. **This report should not be transmitted, disclosed, referred to, or relied upon by any person for any purpose without InterFi's prior written consent.** 

InterFi provides the easy-to-understand assessment of the project, and the smart contract (otherwise known as the source code). The audit makes no statements or warranties on the security of the code. It also cannot be considered as enough assessment regarding the utility and safety of the code, bug-free status, or any other statements of the contract. While we have used all the data at our disposal to provide the transparent analysis, it is important to note that you should not rely on this report only — we recommend proceeding with several independent audits and a public bug bounty program to ensure the security of smart contracts. Be aware that smart contracts deployed on a blockchain aren't resistant to external vulnerability, or a hack. Be aware that active smart contract owner privileges constitute an elevated impact on smart contract safety and security. Therefore, InterFi does not guarantee the explicit security of the audited smart contract.

The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed.

This report should not be considered as an endorsement or disapproval of any project or team.

The information provided in this report does not constitute investment advice, financial advice, trading advice, or any other sort of advice and you should not treat any of the report's content as such. Do conduct your due diligence and consult your financial advisor before making any investment decisions.



## **About InterFi Network**

InterFi Network provides intelligent blockchain solutions. InterFi is developing an ecosystem that is seamless and responsive. Some of our services: Blockchain Security, Token Launchpad, NFT Marketplace, etc. InterFi's mission is to interconnect multiple services like Blockchain Security, DeFi, Gaming, and Marketplace under one ecosystem that is seamless, multi-chain compatible, scalable, secure, fast, responsive, and easy to use.

InterFi is built by a decentralized team of UI experts, contributors, engineers, and enthusiasts from all over the world. Our team currently consists of 6+ core team members, and 10+ casual contributors. InterFi provides manual, static, and automatic smart contract analysis, to ensure that project is checked against known attacks and potential vulnerabilities.

To learn more, visit <a href="https://interfi.network">https://interfi.network</a>

To view our audit portfolio, visit <a href="https://github.com/interfinetwork">https://github.com/interfinetwork</a>

To book an audit, message <a href="https://t.me/interfiaudits">https://t.me/interfiaudits</a>



