



FunFair

# Smart Contract Audit Report

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## Disclaimer

## About Us

# AUDITED DETAILS

## Audited Project

Project name	Token ticker	Blockchain
FunFair	FUN	Ethereum

## Addresses

Contract address	0x419D0d8BdD9aF5e606Ae2232ed285Aff190E711b
Contract deployer address	0x50b26685BC788E164d940F0a73770F4B9196B052

## Project Website

<https://funtoken.io/>

## Codebase

<https://etherscan.io/address/0x419D0d8BdD9aF5e606Ae2232ed285Aff190E711b#code>

# SUMMARY

The FUNToken is an asset developed specifically for the online gambling and gaming industry. FUNToken combines the qualities of the Ethereum blockchain with a cutting-edge tech stack, making FUN a powerful resource for players, platforms, and developers alike.

## Contract Summary

### Documentation Quality

FunFair provides a very poor documentation with standard of solidity base code.

- The technical description is provided unclear and disorganized.

### Code Quality

The Overall quality of the basecode is poor.

- Solidity basecode and rules are unclear and disorganized by FunFair.

### Test Coverage

Test coverage of the project is 100% ( Through Codebase )

## Audit Findings Summary

- SWC-101 | It is recommended to use vetted safe math libraries for arithmetic operations consistently on lines 229, 93 and 231.
- SWC-107 | It is recommended to use a reentrancy lock, reentrancy weaknesses detected on lines 79, 168, 147, 158, 147, 168 and 158.
- SWC-110 SWC-123 | It is recommended to use of revert(), assert(), and require() in Solidity, and the new REVERT opcode in the EVM on lines 147, 80, 168, 158, 93, 95, 141, 195, 115, 132, 96, 178, 59, 219, 229, 231, 163, 77, 111, 49, 203, 116, 32, 188, 107, 97, 183, 45, 123, 209, 179, 57, 153, 119, 145, 112, 79, 135, 166, 120, 126 and 156.
- SWC-113 SWC-128 | It is recommended to implement the contract logic to handle failed calls and block gas limit on lines 80, 168, 158 and 147.

## CONCLUSION

We have audited the FunFair project released in June 2017 to find issues and identify potential security vulnerabilities in the FunFair project. This process is used to find technical issues and security loopholes that may be found in smart contracts.

The security audit report gave unsatisfactory results with the discovery of high-risk issues and several other low-risk issues.

Writing a contract that does not follow the Solidity style guide can pose a significant risk. The high-risk, medium, and low problems we found in the smart contract are the arithmetic operation can underflow, an assertion violation was triggered, multiple calls are executed in the same transaction, a call to a user-supplied address is executed, an assertion violation was triggered, multiple calls are executed in the same transaction. We not recommended to take invest to this kind of risky smart contract.

# AUDIT RESULT

Article	Category	Description	Result
Default Visibility	SWC-100 SWC-108	Functions and state variables visibility should be set explicitly. Visibility levels should be specified consciously.	PASS
Integer Overflow and Underflow	SWC-101	If unchecked math is used, all math operations should be safe from overflows and underflows.	ISSUE FOUND
Outdated Compiler Version	SWC-102	It is recommended to use a recent version of the Solidity compiler.	PASS
Floating Pragma	SWC-103	Contracts should be deployed with the same compiler version and flags that they have been tested thoroughly.	PASS
Unchecked Call Return Value	SWC-104	The return value of a message call should be checked.	PASS
Unprotected Ether Withdrawal	SWC-105	Due to missing or insufficient access controls, malicious parties can withdraw from the contract.	PASS
SELFDESTRUCT Instruction	SWC-106	The contract should not be self-destructible while it has funds belonging to users.	PASS
Reentrancy	SWC-107	Check effect interaction pattern should be followed if the code performs recursive call.	ISSUE FOUND
Uninitialized Storage Pointer	SWC-109	Uninitialized local storage variables can point to unexpected storage locations in the contract.	PASS
Assert Violation	SWC-110 SWC-123	Properly functioning code should never reach a failing assert statement.	ISSUE FOUND
Deprecated Solidity Functions	SWC-111	Deprecated built-in functions should never be used.	PASS
Delegate call to Untrusted Callee	SWC-112	Delegatecalls should only be allowed to trusted addresses.	PASS

DoS (Denial of Service)	SWC-113 SWC-128	Execution of the code should never be blocked by a specific contract state unless required.	<b>ISSUE FOUND</b>
Race Conditions	SWC-114	Race Conditions and Transactions Order Dependency should not be possible.	<b>PASS</b>
Authorization through tx.origin	SWC-115	tx.origin should not be used for authorization.	<b>PASS</b>
Block values as a proxy for time	SWC-116	Block numbers should not be used for time calculations.	<b>PASS</b>
Signature Unique ID	SWC-117 SWC-121 SWC-122	Signed messages should always have a unique id. A transaction hash should not be used as a unique id.	<b>PASS</b>
Incorrect Constructor Name	SWC-118	Constructors are special functions that are called only once during the contract creation.	<b>PASS</b>
Shadowing State Variable	SWC-119	State variables should not be shadowed.	<b>PASS</b>
Weak Sources of Randomness	SWC-120	Random values should never be generated from Chain Attributes or be predictable.	<b>PASS</b>
Write to Arbitrary Storage Location	SWC-124	The contract is responsible for ensuring that only authorized user or contract accounts may write to sensitive storage locations.	<b>PASS</b>
Incorrect Inheritance Order	SWC-125	When inheriting multiple contracts, especially if they have identical functions, a developer should carefully specify inheritance in the correct order. The rule of thumb is to inherit contracts from more /general/ to more /specific/.	<b>PASS</b>
Insufficient Gas Griefing	SWC-126	Insufficient gas griefing attacks can be performed on contracts which accept data and use it in a sub-call on another contract.	<b>PASS</b>
Arbitrary Jump Function	SWC-127	As Solidity doesnt support pointer arithmetics, it is impossible to change such variable to an arbitrary value.	<b>PASS</b>

Typographical Error	SWC-129	A typographical error can occur for example when the intent of a defined operation is to sum a number to a variable.	PASS
Override control character	SWC-130	Malicious actors can use the Right-To-Left-Override unicode character to force RTL text rendering and confuse users as to the real intent of a contract.	PASS
Unused variables	SWC-131 SWC-135	Unused variables are allowed in Solidity and they do not pose a direct security issue.	PASS
Unexpected Ether balance	SWC-132	Contracts can behave erroneously when they strictly assume a specific Ether balance.	PASS
Hash Collisions Variable	SWC-133	Using <code>abi.encodePacked()</code> with multiple variable length arguments can, in certain situations, lead to a hash collision.	PASS
Hardcoded gas amount	SWC-134	The <code>transfer()</code> and <code>send()</code> functions forward a fixed amount of 2300 gas.	PASS
Unencrypted Private Data	SWC-136	It is a common misconception that private type variables cannot be read.	PASS



# SMART CONTRACT ANALYSIS

Started	Thursday Jul 06 2017 05:32:46 GMT+0000 (Coordinated Universal Time)
Finished	Friday Jul 07 2017 20:42:39 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	Token.sol

## Detected Issues

ID	Title	Severity	Status
SWC-101	THE ARITHMETIC OPERATION CAN UNDERFLOW.	high	acknowledged
SWC-101	THE ARITHMETIC OPERATION CAN UNDERFLOW.	high	acknowledged
SWC-101	THE ARITHMETIC OPERATOR CAN OVERFLOW.	high	acknowledged
SWC-110	AN ASSERTION VIOLATION WAS TRIGGERED.	medium	acknowledged
SWC-110	AN ASSERTION VIOLATION WAS TRIGGERED.	medium	acknowledged
SWC-110	AN ASSERTION VIOLATION WAS TRIGGERED.	medium	acknowledged
SWC-110	AN ASSERTION VIOLATION WAS TRIGGERED.	medium	acknowledged
SWC-113	MULTIPLE CALLS ARE EXECUTED IN THE SAME TRANSACTION.	medium	acknowledged
SWC-113	MULTIPLE CALLS ARE EXECUTED IN THE SAME TRANSACTION.	medium	acknowledged
SWC-113	MULTIPLE CALLS ARE EXECUTED IN THE SAME TRANSACTION.	medium	acknowledged
SWC-107	A CALL TO A USER-SUPPLIED ADDRESS IS EXECUTED.	low	acknowledged
SWC-107	READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.	low	acknowledged
SWC-107	READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.	low	acknowledged
SWC-107	READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.	low	acknowledged



SWC-110	AN ASSERTION VIOLATION WAS TRIGGERED.	low	acknowledged
SWC-110	AN ASSERTION VIOLATION WAS TRIGGERED.	low	acknowledged
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SWC-110	AN ASSERTION VIOLATION WAS TRIGGERED.	low	acknowledged
SWC-113	MULTIPLE CALLS ARE EXECUTED IN THE SAME TRANSACTION.	low	acknowledged

## SWC-101 | THE ARITHMETIC OPERATION CAN UNDERFLOW.

LINE 229

### high SEVERITY

It is possible to cause an arithmetic underflow. Prevent the underflow by constraining inputs using the `require()` statement or use the OpenZeppelin SafeMath library for integer arithmetic operations. Refer to the transaction trace generated for this issue to reproduce the underflow.

### Source File

- Token.sol

### Locations

```
228
229 string public motd;
230 event Motd(string message);
231 function setMotd(string _m) onlyOwner {
232     motd = _m;
233 }
```

## SWC-101 | THE ARITHMETIC OPERATION CAN UNDERFLOW.

LINE 93

### high SEVERITY

It is possible to cause an arithmetic underflow. Prevent the underflow by constraining inputs using the `require()` statement or use the OpenZeppelin `SafeMath` library for integer arithmetic operations. Refer to the transaction trace generated for this issue to reproduce the underflow.

### Source File

- Token.sol

### Locations

```
92
93 contract Token is Finalizable, TokenReceivable, SafeMath, EventDefinitions {
94
95     string public name = "FunFair";
96     uint8 public decimals = 8;
97
```

# SWC-101 | THE ARITHMETIC OPERATOR CAN OVERFLOW.

LINE 231

## high SEVERITY

It is possible to cause an integer overflow or underflow in the arithmetic operation.

## Source File

- Token.sol

## Locations

```
230 event Motd(string message);
231 function setMotd(string _m) onlyOwner {
232     motd = _m;
233     Motd(_m);
234 }
235
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 147

### medium SEVERITY

It is possible to trigger an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
146
147 success = controller.approve(msg.sender, _spender, _value);
148 if (success) {
149     Approval(msg.sender, _spender, _value);
150 }
151
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 80

### medium SEVERITY

It is possible to trigger an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
79  uint balance = token.balanceOf(this);
80  if (token.transfer(_to, balance)) {
81  logTokenTransfer(_token, _to, balance);
82  return true;
83  }
84
```



## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 168

### medium SEVERITY

It is possible to trigger an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
167     if (success) {
168         uint newval = controller.allowance(msg.sender, _spender);
169         Approval(msg.sender, _spender, newval);
170     }
171 }
172
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 158

### medium SEVERITY

It is possible to trigger an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
157     if (success) {
158         uint newval = controller.allowance(msg.sender, _spender);
159         Approval(msg.sender, _spender, newval);
160     }
161 }
162
```

## SWC-113 | MULTIPLE CALLS ARE EXECUTED IN THE SAME TRANSACTION.

LINE 80

### medium SEVERITY

This call is executed following another call within the same transaction. It is possible that the call never gets executed if a prior call fails permanently. This might be caused intentionally by a malicious callee. If possible, refactor the code such that each transaction only executes one external call or make sure that all callees can be trusted (i.e. they're part of your own codebase).

### Source File

- Token.sol

### Locations

```
79  uint balance = token.balanceOf(this);
80  if (token.transfer(_to, balance)) {
81  logTokenTransfer(_token, _to, balance);
82  return true;
83  }
84
```

## SWC-113 | MULTIPLE CALLS ARE EXECUTED IN THE SAME TRANSACTION.

LINE 168

### medium SEVERITY

This call is executed following another call within the same transaction. It is possible that the call never gets executed if a prior call fails permanently. This might be caused intentionally by a malicious callee. If possible, refactor the code such that each transaction only executes one external call or make sure that all callees can be trusted (i.e. they're part of your own codebase).

### Source File

- Token.sol

### Locations

```
167     if (success) {
168         uint newval = controller.allowance(msg.sender, _spender);
169         Approval(msg.sender, _spender, newval);
170     }
171 }
172
```

## SWC-113 | MULTIPLE CALLS ARE EXECUTED IN THE SAME TRANSACTION.

LINE 158

### medium SEVERITY

This call is executed following another call within the same transaction. It is possible that the call never gets executed if a prior call fails permanently. This might be caused intentionally by a malicious callee. If possible, refactor the code such that each transaction only executes one external call or make sure that all callees can be trusted (i.e. they're part of your own codebase).

### Source File

- Token.sol

### Locations

```
157     if (success) {
158         uint newval = controller.allowance(msg.sender, _spender);
159         Approval(msg.sender, _spender, newval);
160     }
161 }
162
```

## SWC-107 | A CALL TO A USER-SUPPLIED ADDRESS IS EXECUTED.

LINE 79

### low SEVERITY

An external message call to an address specified by the caller is executed. Note that the callee account might contain arbitrary code and could re-enter any function within this contract. Reentering the contract in an intermediate state may lead to unexpected behaviour. Make sure that no state modifications are executed after this call and/or reentrancy guards are in place.

### Source File

- Token.sol

### Locations

```
78  IToken token = IToken(_token);
79  uint balance = token.balanceOf(this);
80  if (token.transfer(_to, balance)) {
81  logTokenTransfer(_token, _to, balance);
82  return true;
83
```

## SWC-107 | READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.

LINE 168

### low SEVERITY

The contract account state is accessed after an external call. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- Token.sol

### Locations

```
167     if (success) {
168         uint newval = controller.allowance(msg.sender, _spender);
169         Approval(msg.sender, _spender, newval);
170     }
171 }
172
```

## SWC-107 | READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL

LINE 147

### low SEVERITY

The contract account state is accessed after an external call to a fixed address. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- Token.sol

### Locations

```
146
147 success = controller.approve(msg.sender, _spender, _value);
148 if (success) {
149     Approval(msg.sender, _spender, _value);
150 }
151
```



## SWC-107 | READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.

LINE 158

### low SEVERITY

The contract account state is accessed after an external call. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- Token.sol

### Locations

```
157     if (success) {
158         uint newval = controller.allowance(msg.sender, _spender);
159         Approval(msg.sender, _spender, newval);
160     }
161 }
162
```

## SWC-107 | WRITE TO PERSISTENT STATE FOLLOWING EXTERNAL CALL

LINE 147

### low SEVERITY

The contract account state is accessed after an external call to a fixed address. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- Token.sol

### Locations

```
146
147 success = controller.approve(msg.sender, _spender, _value);
148 if (success) {
149     Approval(msg.sender, _spender, _value);
150 }
151
```

## SWC-107 | WRITE TO PERSISTENT STATE FOLLOWING EXTERNAL CALL

LINE 168

### low SEVERITY

The contract account state is accessed after an external call to a fixed address. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- Token.sol

### Locations

```
167     if (success) {
168         uint newval = controller.allowance(msg.sender, _spender);
169         Approval(msg.sender, _spender, newval);
170     }
171 }
172
```

## SWC-107 | WRITE TO PERSISTENT STATE FOLLOWING EXTERNAL CALL

LINE 158

### low SEVERITY

The contract account state is accessed after an external call to a fixed address. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- Token.sol

### Locations

```
157     if (success) {
158         uint newval = controller.allowance(msg.sender, _spender);
159         Approval(msg.sender, _spender, newval);
160     }
161 }
162
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 93

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
92
93  contract Token is Finalizable, TokenReceivable, SafeMath, EventDefinitions {
94
95  string public name = "FunFair";
96  uint8 public decimals = 8;
97
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 95

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
94
95  string public name = "FunFair";
96  uint8 public decimals = 8;
97  string public symbol = "FUN";
98
99
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 141

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
140
141 function approve(address _spender, uint _value)
142     onlyPayloadSize(2)
143     returns (bool success) {
144     //promote safe user behavior
145
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 195

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
194
195  bool public multilocked;
196
197  modifier notMultilocked {
198    assert(!multilocked);
199  }
```



## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 115

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
114
115     function totalSupply() constant returns (uint) {
116         return controller.totalSupply();
117     }
118
119
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 132

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
131
132 function transferFrom(address _from, address _to, uint _value)
133     onlyPayloadSize(3)
134     returns (bool success) {
135     success = controller.transferFrom(msg.sender, _from, _to, _value);
136
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 96

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
95  string public name = "FunFair";
96  uint8 public decimals = 8;
97  string public symbol = "FUN";
98
99  Controller controller;
100
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 178

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
177
178 function burn(uint _amount) {
179     controller.burn(msg.sender, _amount);
180     Transfer(msg.sender, 0x0, _amount);
181 }
182
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 59

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
58
59  function finalize() onlyOwner {
60  finalized = true;
61  }
62
63
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 219

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
218
219 function multiApprove(uint[] bits) onlyOwner notMultilocked {
220     if (bits.length % 3 != 0) throw;
221     for (uint i=0; i<bits.length; i += 3) {
222         address owner = address(bits[i]);
223
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 229

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
228
229  string public motd;
230  event Motd(string message);
231  function setMotd(string _m) onlyOwner {
232    motd = _m;
233
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 231

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
230 event Motd(string message);
231 function setMotd(string _m) onlyOwner {
232     motd = _m;
233     Motd(_m);
234 }
235
```



## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 163

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
162
163  function decreaseApproval (address _spender, uint _subtractedValue)
164  onlyPayloadSize(2)
165  returns (bool success) {
166  success = controller.decreaseApproval(msg.sender, _spender, _subtractedValue);
167
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 77

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
76
77  function claimTokens(address _token, address _to) onlyOwner returns (bool) {
78  IToken token = IToken(_token);
79  uint balance = token.balanceOf(this);
80  if (token.transfer(_to, balance)) {
81
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 111

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
110
111     function balanceOf(address a) constant returns (uint) {
112         return controller.balanceOf(a);
113     }
114
115
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 49

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
48
49  function acceptOwnership() {
50  if (msg.sender == newOwner) {
51  owner = newOwner;
52  }
53
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 203

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
202 //do we want lock permanent? I think so.  
203 function lockMultis() onlyOwner {  
204     multilocked = true;  
205 }  
206  
207
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 116

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
115 function totalSupply() constant returns (uint) {
116 return controller.totalSupply();
117 }
118
119 function allowance(address _owner, address _spender) constant returns (uint) {
120
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 32

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
31  contract Owned {
32  address public owner;
33
34  function Owned() {
35  owner = msg.sender;
36
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 188

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
187
188 function controllerApprove(address _owner, address _spender, uint _value)
189     onlyController {
190     Approval(_owner, _spender, _value);
191     }
192
```



## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 107

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
106
107   function setController(address _c) onlyOwner notFinalized {
108       controller = Controller(_c);
109   }
110
111
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 97

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
96  uint8 public decimals = 8;  
97  string public symbol = "FUN";  
98  
99  Controller controller;  
100  address owner;  
101
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 183

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
182
183 function controllerTransfer(address _from, address _to, uint _value)
184     onlyController {
185     Transfer(_from, _to, _value);
186     }
187
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 45

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
44
45  function changeOwner(address _newOwner) onlyOwner {
46  newOwner = _newOwner;
47  }
48
49
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 123

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
122
123  function transfer(address _to, uint _value)
124  onlyPayloadSize(2)
125  returns (bool success) {
126  success = controller.transfer(msg.sender, _to, _value);
127
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 209

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
208
209 function multiTransfer(uint[] bits) onlyOwner notMultilocked {
210     if (bits.length % 3 != 0) throw;
211     for (uint i=0; i<bits.length; i += 3) {
212         address from = address(bits[i]);
213
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 179

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
178 function burn(uint _amount) {
179 controller.burn(msg.sender, _amount);
180 Transfer(msg.sender, 0x0, _amount);
181 }
182
183
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 57

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
56 contract Finalizable is Owned {
57   bool public finalized;
58
59   function finalize() onlyOwner {
60     finalized = true;
61 }
```



## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 153

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
152
153 function increaseApproval (address _spender, uint _addedValue)
154 onlyPayloadSize(2)
155 returns (bool success) {
156 success = controller.increaseApproval(msg.sender, _spender, _addedValue);
157
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 119

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
118
119     function allowance(address _owner, address _spender) constant returns (uint) {
120         return controller.allowance(_owner, _spender);
121     }
122
123
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 145

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
144 //promote safe user behavior
145 if (controller.allowance(msg.sender, _spender) > 0) throw;
146
147 success = controller.approve(msg.sender, _spender, _value);
148 if (success) {
149
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 112

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
111 function balanceOf(address a) constant returns (uint) {
112     return controller.balanceOf(a);
113 }
114
115 function totalSupply() constant returns (uint) {
116
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 79

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
78  IToken token = IToken(_token);
79  uint balance = token.balanceOf(this);
80  if (token.transfer(_to, balance)) {
81  logTokenTransfer(_token, _to, balance);
82  return true;
83
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 135

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
134 returns (bool success) {
135     success = controller.transferFrom(msg.sender, _from, _value);
136     if (success) {
137         Transfer(_from, _to, _value);
138     }
139 }
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 166

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
165     returns (bool success) {
166     success = controller.decreaseApproval(msg.sender, _spender, _subtractedValue);
167     if (success) {
168     uint newval = controller.allowance(msg.sender, _spender);
169     Approval(msg.sender, _spender, newval);
170
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 120

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
119     function allowance(address _owner, address _spender) constant returns (uint) {
120         return controller.allowance(_owner, _spender);
121     }
122
123     function transfer(address _to, uint _value)
124
```



## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 126

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
125     returns (bool success) {
126     success = controller.transfer(msg.sender, _to, _value);
127     if (success) {
128     Transfer(msg.sender, _to, _value);
129     }
130 }
```

## SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 156

### low SEVERITY

It is possible to cause an assertion violation. Note that Solidity `assert()` statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use `require()` instead of `assert()` if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

### Source File

- Token.sol

### Locations

```
155     returns (bool success) {
156     success = controller.increaseApproval(msg.sender, _spender, _addedValue);
157     if (success) {
158     uint newval = controller.allowance(msg.sender, _spender);
159     Approval(msg.sender, _spender, newval);
160
```

## SWC-113 | MULTIPLE CALLS ARE EXECUTED IN THE SAME TRANSACTION.

LINE 147

### low SEVERITY

This call is executed following another call within the same transaction. It is possible that the call never gets executed if a prior call fails permanently. This might be caused intentionally by a malicious callee. If possible, refactor the code such that each transaction only executes one external call or make sure that all callees can be trusted (i.e. they're part of your own codebase).

### Source File

- Token.sol

### Locations

```
146
147 success = controller.approve(msg.sender, _spender, _value);
148 if (success) {
149     Approval(msg.sender, _spender, _value);
150 }
151
```

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