



AlpacaToken
Smart Contract
Audit Report

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AUDITED DETAILS

Audited Project

Project name	Token ticker	Blockchain
AlpacaToken	ALPACA	Binance Smart Chain

Addresses

Contract address	0x8f0528ce5ef7b51152a59745befdd91d97091d2f
Contract deployer address	0xC44f82b07Ab3E691F826951a6E335E1bC1bB0B51

Project Website

<https://www.alpacafinance.org/>

Codebase

<https://bscscan.com/address/0x8f0528ce5ef7b51152a59745befdd91d97091d2f#code>

SUMMARY

Alpaca Finance is the largest lending protocol allowing leveraged yield farming on BNB Chain. It helps lenders earn safe and stable yields, and offers borrowers undercollateralized loans for leveraged yield farming positions, vastly multiplying their farming principals and resulting profits. As an enabler for the entire DeFi ecosystem, Alpaca amplifies the liquidity layer of integrated exchanges, improving their capital efficiency by connecting LP borrowers and lenders. It's through this empowering function that Alpaca has become a fundamental building block within DeFi, helping bring the power of finance to each and every person's fingertips, and every alpaca's paw... Furthermore, alpacas are a virtuous breed. That's why, we are a fair-launch project with no pre-sale, no investor, and no pre-mine. So from the beginning, this has always been a product built by the people, for the people.

Contract Summary

Documentation Quality

AlpacaToken provides a very good documentation with standard of solidity base code.

- The technical description is provided clearly and structured and also don't have any high risk issue.

Code Quality

The Overall quality of the basecode is standard.

- Standard solidity basecode and rules are already followed by AlpacaToken with the discovery of several low issues.

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 103, 115, 128, 129, 140, 150, 164, 181, 196, 197, 215, 232, 250, 270, 290, 1134, 1146, 1165, 1166, 1175, 1177, 1177, 1177, 1184, 1209, 1217, 1232, 1233, 1236, 1243, 1477, 1519, 1146, 1165, 1166, 1175, 1184, 1209, 1217, 1232 and 1233.
- 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 1331, 1459, 1461, 1477, 1505, 1522, 1554, 1578, 1595, 1601 and 1601.

- SWC-120 | It is recommended to use external sources of randomness via oracles on lines 1005, 1009, 1016, 1029, 1157, 1230, 1420, 1441, 1442, 1508, 1511, 1522, 1526, 1527, 1534, 1540 and 1551.



CONCLUSION

We have audited the AlpacaToken project released on February 2021 to discover issues and identify potential security vulnerabilities in AlpacaToken Project. This process is used to find technical issues and security loopholes which might be found in the smart contract.

The security audit report provides a satisfactory result with some low-risk issues.

The issues found in the AlpacaToken smart contract code do not pose a considerable risk. The writing of the contract is close to the standard of writing contracts in general. The low-risk issues found are some arithmetic operation issues, public state variables with array type causing reachable exception by default, the potential use of "block.number" as a source of randomness, and out-of-bounds array access which the index access expression can cause an exception in case of the use of an invalid array index value. The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number, and timestamp are predictable and can be manipulated by a malicious miner. Also, keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that the use of these variables introduces a certain level of trust into miners.

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.	PASS
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.	PASS
Race Conditions	SWC-114	Race Conditions and Transactions Order Dependency should not be possible.	PASS
Authorization through tx.origin	SWC-115	tx.origin should not be used for authorization.	PASS
Block values as a proxy for time	SWC-116	Block numbers should not be used for time calculations.	PASS
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.	PASS
Incorrect Constructor Name	SWC-118	Constructors are special functions that are called only once during the contract creation.	PASS
Shadowing State Variable	SWC-119	State variables should not be shadowed.	PASS
Weak Sources of Randomness	SWC-120	Random values should never be generated from Chain Attributes or be predictable.	ISSUE FOUND
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.	PASS
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/.	PASS
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.	PASS
Arbitrary Jump Function	SWC-127	As Solidity doesnt support pointer arithmetics, it is impossible to change such variable to an arbitrary value.	PASS

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

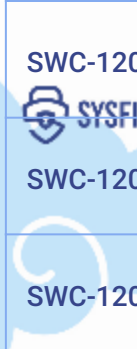
SMART CONTRACT ANALYSIS


Started	Friday Feb 26 2021 18:11:56 GMT+0000 (Coordinated Universal Time)
Finished	Saturday Feb 27 2021 04:36:18 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	AlpacaToken.sol



Detected Issues

ID	Title	Severity	Status
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "%" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "%" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged

SWC-101	ARITHMETIC OPERATION "%" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "++" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "++" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "++" DISCOVERED	low	acknowledged
SWC-101	COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED	low	acknowledged



SWC-120 	POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.	low	acknowledged
SWC-120	POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.	low	acknowledged
SWC-120	POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.	low	acknowledged



SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 103

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
102 function tryAdd(uint256 a, uint256 b) internal pure returns (bool, uint256) {
103     uint256 c = a + b;
104     if (c < a) return (false, 0);
105     return (true, c);
106 }
107
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 115

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
114   if (b > a) return (false, 0);
115   return (true, a - b);
116   }
117
118   /**
119
```


SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 128

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
127   if (a == 0) return (true, 0);
128   uint256 c = a * b;
129   if (c / a != b) return (false, 0);
130   return (true, c);
131   }
132
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 129

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
128  uint256 c = a * b;  
129  if (c / a != b) return (false, 0);  
130  return (true, c);  
131  }  
132  
133
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 140

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
139   if (b == 0) return (false, 0);
140   return (true, a / b);
141   }
142
143   /**
144
```

SWC-101 | ARITHMETIC OPERATION "%" DISCOVERED

LINE 150

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
149   if (b == 0) return (false, 0);
150   return (true, a % b);
151   }
152
153   /**
154
```

SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 164

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
163     function add(uint256 a, uint256 b) internal pure returns (uint256) {
164         uint256 c = a + b;
165         require(c >= a, "SafeMath: addition overflow");
166         return c;
167     }
168
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 181

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
180     require(b <= a, "SafeMath: subtraction overflow");
181     return a - b;
182   }
183
184   /**
185
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 196

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
195     if (a == 0) return 0;
196     uint256 c = a * b;
197     require(c / a == b, "SafeMath: multiplication overflow");
198     return c;
199 }
200
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 197

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
196 uint256 c = a * b;
197 require(c / a == b, "SafeMath: multiplication overflow");
198 return c;
199 }
200
201
```


SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 215

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
214     require(b > 0, "SafeMath: division by zero");
215     return a / b;
216 }
217
218 /**
219
```

SWC-101 | ARITHMETIC OPERATION "%" DISCOVERED

LINE 232

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
231     require(b > 0, "SafeMath: modulo by zero");
232     return a % b;
233 }
234
235 /**
236
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 250

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
249   require(b <= a, errorMessage);
250   return a - b;
251   }
252
253   /**
254
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 270

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
269     require(b > 0, errorMessage);
270     return a / b;
271 }
272
273 /**
274
```

SWC-101 | ARITHMETIC OPERATION "%" DISCOVERED

LINE 290

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
289     require(b > 0, errorMessage);
290     return a % b;
291   }
292 }
293
294
```

SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

LINE 1134

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1133     require(signatory != address(0), "ALPACA::delegateBySig: invalid signature");
1134     require(nonce == nonces[signatory]++, "ALPACA::delegateBySig: invalid nonce");
1135     require(now <= expiry, "ALPACA::delegateBySig: signature expired");
1136     return _delegate(signatory, delegatee);
1137 }
1138
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 1146

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1145     uint32 nCheckpoints = numCheckpoints[account];
1146     return nCheckpoints > 0 ? checkpoints[account][nCheckpoints - 1].votes : 0;
1147 }
1148
1149 /**
1150
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 1165

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1164 // First check most recent balance
1165 if (checkpoints[account][nCheckpoints - 1].fromBlock <= blockNumber) {
1166     return checkpoints[account][nCheckpoints - 1].votes;
1167 }
1168
1169
```


SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 1166

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1165   if (checkpoints[account][nCheckpoints - 1].fromBlock <= blockNumber) {
1166     return checkpoints[account][nCheckpoints - 1].votes;
1167   }
1168
1169   // Next check implicit zero balance
1170
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 1175

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1174 uint32 lower = 0;
1175 uint32 upper = nCheckpoints - 1;
1176 while (upper > lower) {
1177     uint32 center = upper - (upper - lower) / 2; // ceil, avoiding overflow
1178     Checkpoint memory cp = checkpoints[account][center];
1179 }
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 1177

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1176 while (upper > lower) {  
1177     uint32 center = upper - (upper - lower) / 2; // ceil, avoiding overflow  
1178     Checkpoint memory cp = checkpoints[account][center];  
1179     if (cp.fromBlock == blockNumber) {  
1180         return cp.votes;  
1181     }
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 1177

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1176 while (upper > lower) {
1177     uint32 center = upper - (upper - lower) / 2; // ceil, avoiding overflow
1178     Checkpoint memory cp = checkpoints[account][center];
1179     if (cp.fromBlock == blockNumber) {
1180         return cp.votes;
1181     }
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 1177

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1176 while (upper > lower) {  
1177     uint32 center = upper - (upper - lower) / 2; // ceil, avoiding overflow  
1178     Checkpoint memory cp = checkpoints[account][center];  
1179     if (cp.fromBlock == blockNumber) {  
1180         return cp.votes;  
1181     }
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 1184

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1183     } else {  
1184         upper = center - 1;  
1185     }  
1186 }  
1187 return checkpoints[account][lower].votes;  
1188
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 1209

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1208     uint32 srcRepNum = numCheckpoints[srcRep];
1209     uint256 srcRepOld = srcRepNum > 0 ? checkpoints[srcRep][srcRepNum - 1].votes : 0;
1210     uint256 srcRepNew = srcRepOld.sub(amount);
1211     _writeCheckpoint(srcRep, srcRepNum, srcRepOld, srcRepNew);
1212 }
1213
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 1217

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1216 uint32 dstRepNum = numCheckpoints[dstRep];
1217 uint256 dstRepOld = dstRepNum > 0 ? checkpoints[dstRep][dstRepNum - 1].votes : 0;
1218 uint256 dstRepNew = dstRepOld.add(amount);
1219 _writeCheckpoint(dstRep, dstRepNum, dstRepOld, dstRepNew);
1220 }
1221
```


SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 1232

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1231
1232   if (nCheckpoints > 0 && checkpoints[delegatee][nCheckpoints - 1].fromBlock ==
blockNumber) {
1233     checkpoints[delegatee][nCheckpoints - 1].votes = newVotes;
1234   } else {
1235     checkpoints[delegatee][nCheckpoints] = Checkpoint(blockNumber, newVotes);
1236
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 1233

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1232  if (nCheckpoints > 0 && checkpoints[delegatee][nCheckpoints - 1].fromBlock ==
blockNumber) {
1233  checkpoints[delegatee][nCheckpoints - 1].votes = newVotes;
1234  } else {
1235  checkpoints[delegatee][nCheckpoints] = Checkpoint(blockNumber, newVotes);
1236  numCheckpoints[delegatee] = nCheckpoints + 1;
1237
```

SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 1236

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1235 checkpoints[delegatee][nCheckpoints] = Checkpoint(blockNumber, newVotes);
1236 numCheckpoints[delegatee] = nCheckpoints + 1;
1237 }
1238
1239 emit DelegateVotesChanged(delegatee, oldVotes, newVotes);
1240
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 1243

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1242 function safe32(uint256 n, string memory errorMessage) internal pure returns
(uint32) {
1243     require(n < 2**32, errorMessage);
1244     return uint32(n);
1245 }
1246
1247
```

SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

LINE 1477

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1476     uint256 alpacaReward =
multiplier.mul(alpacaPerBlock).mul(pool.allocPoint).div(totalAllocPoint);
1477     accAlpacaPerShare = accAlpacaPerShare.add(alpacaReward.mul(1e12).div(lpSupply));
1478     }
1479     return user.amount.mul(accAlpacaPerShare).div(1e12).sub(user.rewardDebt);
1480     }
1481
```

SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

LINE 1519

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1518
1519 // Deposit Staking tokens to FairLaunchToken for ALPACA allocation.
1520 function deposit(address _for, uint256 _pid, uint256 _amount) public override {
1521     PoolInfo storage pool = poolInfo[_pid];
1522     UserInfo storage user = userInfo[_pid][_for];
1523
```

SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 1146

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1145     uint32 nCheckpoints = numCheckpoints[account];
1146     return nCheckpoints > 0 ? checkpoints[account][nCheckpoints - 1].votes : 0;
1147 }
1148
1149 /**
1150
```

SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 1165

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1164 // First check most recent balance
1165 if (checkpoints[account][nCheckpoints - 1].fromBlock <= blockNumber) {
1166     return checkpoints[account][nCheckpoints - 1].votes;
1167 }
1168
1169
```


SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 1166

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1165   if (checkpoints[account][nCheckpoints - 1].fromBlock <= blockNumber) {  
1166     return checkpoints[account][nCheckpoints - 1].votes;  
1167   }  
1168  
1169   // Next check implicit zero balance  
1170
```

SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 1175

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1174 uint32 lower = 0;
1175 uint32 upper = nCheckpoints - 1;
1176 while (upper > lower) {
1177     uint32 center = upper - (upper - lower) / 2; // ceil, avoiding overflow
1178     Checkpoint memory cp = checkpoints[account][center];
1179 }
```

SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 1184

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1183     } else {  
1184     upper = center - 1;  
1185     }  
1186     }  
1187     return checkpoints[account][lower].votes;  
1188
```

SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 1209

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1208 uint32 srcRepNum = numCheckpoints[srcRep];
1209 uint256 srcRepOld = srcRepNum > 0 ? checkpoints[srcRep][srcRepNum - 1].votes : 0;
1210 uint256 srcRepNew = srcRepOld.sub(amount);
1211 _writeCheckpoint(srcRep, srcRepNum, srcRepOld, srcRepNew);
1212 }
1213
```

SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 1217

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1216     uint32 dstRepNum = numCheckpoints[dstRep];
1217     uint256 dstRepOld = dstRepNum > 0 ? checkpoints[dstRep][dstRepNum - 1].votes : 0;
1218     uint256 dstRepNew = dstRepOld.add(amount);
1219     _writeCheckpoint(dstRep, dstRepNum, dstRepOld, dstRepNew);
1220 }
1221
```

SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 1232

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1231
1232   if (nCheckpoints > 0 && checkpoints[delegatee][nCheckpoints - 1].fromBlock ==
blockNumber) {
1233     checkpoints[delegatee][nCheckpoints - 1].votes = newVotes;
1234   } else {
1235     checkpoints[delegatee][nCheckpoints] = Checkpoint(blockNumber, newVotes);
1236
```

SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 1233

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- AlpacaToken.sol

Locations

```
1232  if (nCheckpoints > 0 && checkpoints[delegatee][nCheckpoints - 1].fromBlock ==
blockNumber) {
1233  checkpoints[delegatee][nCheckpoints - 1].votes = newVotes;
1234  } else {
1235  checkpoints[delegatee][nCheckpoints] = Checkpoint(blockNumber, newVotes);
1236  numCheckpoints[delegatee] = nCheckpoints + 1;
1237
```

SWC-110 | PUBLIC STATE VARIABLE WITH ARRAY TYPE CAUSING REACHABLE EXCEPTION BY DEFAULT.

LINE 1331

low SEVERITY

The public state variable "poolInfo" in "FairLaunch" contract has type "struct FairLaunch.PoolInfo[]" and can cause an exception in case of use of invalid array index value.

Source File

- AlpacaToken.sol

Locations

```
1330 // Info of each pool.
1331 PoolInfo[] public poolInfo;
1332 // Info of each user that stakes Staking tokens.
1333 mapping(uint256 => mapping(address => UserInfo)) public userInfo;
1334 // Total allocation points. Must be the sum of all allocation points in all pools.
1335
```


SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1459

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- AlpacaToken.sol

Locations

```
1458   if (_currentBlock <= bonusEndBlock) {  
1459     return _currentBlock.sub(_lastRewardBlock).mul(bonusMultiplier);  
1460   }  
1461   if (_lastRewardBlock >= bonusEndBlock) {  
1462     return _currentBlock.sub(_lastRewardBlock);  
1463   }
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1461

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- AlpacaToken.sol

Locations

```
1460 }
1461 if (_lastRewardBlock >= bonusEndBlock) {
1462     return _currentBlock.sub(_lastRewardBlock);
1463 }
1464 // This is the case where bonusEndBlock is in the middle of _lastRewardBlock and
    _currentBlock block.
1465
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1477

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- AlpacaToken.sol

Locations

```
1476     uint256 alpacaReward =
multiplier.mul(alpacaPerBlock).mul(pool.allocPoint).div(totalAllocPoint);
1477     accAlpacaPerShare = accAlpacaPerShare.add(alpacaReward.mul(1e12).div(lpSupply));
1478     }
1479     return user.amount.mul(accAlpacaPerShare).div(1e12).sub(user.rewardDebt);
1480     }
1481
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1505

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- AlpacaToken.sol

Locations

```
1504     alpaca.mint(address(this), alpacaReward);
1505     pool.accAlpacaPerShare =
pool.accAlpacaPerShare.add(alpacaReward.mul(1e12).div(lpSupply));
1506     // update accAlpacaPerShareTilBonusEnd
1507     if (block.number <= bonusEndBlock) {
1508         alpaca.lock(devaddr, alpacaReward.div(10).mul(bonusLockUpBps).div(10000));
1509     }
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1522

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- AlpacaToken.sol

Locations

```
1521 PoolInfo storage pool = poolInfo[_pid];
1522 UserInfo storage user = userInfo[_pid][_for];
1523 if (user.fundedBy != address(0)) require(user.fundedBy == msg.sender, "bad sof");
1524 require(pool.stakeToken != address(0), "deposit: not accept deposit");
1525 updatePool(_pid);
1526
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1554

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- AlpacaToken.sol

Locations

```
1553 user.bonusDebt = user.amount.mul(pool.accAlpacaPerShareTilBonusEnd).div(1e12);
1554 if (pool.stakeToken != address(0)) {
1555     IERC20(pool.stakeToken).safeTransfer(address(msg.sender), _amount);
1556 }
1557 emit Withdraw(msg.sender, _pid, user.amount);
1558
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1578

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- AlpacaToken.sol

Locations

```
1577     safeAlpacaTransfer(_to, pending);
1578     alpaca.lock(_to, bonus.mul(bonusLockUpBps).div(10000));
1579 }
1580
1581 // Withdraw without caring about rewards. EMERGENCY ONLY.
1582
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1595

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- AlpacaToken.sol

Locations

```
1594   if (_amount > alpacaBal) {
1595     alpaca.transfer(_to, alpacaBal);
1596   } else {
1597     alpaca.transfer(_to, _amount);
1598   }
1599
```


SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1601

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- AlpacaToken.sol

Locations

```
1600  
1601   }  
1602
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1601

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- AlpacaToken.sol

Locations

```
1600  
1601   }  
1602
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1005

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1004 // When block number less than startReleaseBlock, no ALPACAs can be unlocked
1005 if (block.number < startReleaseBlock) {
1006     return 0;
1007 }
1008 // When block number more than endReleaseBlock, all locked ALPACAs can be unlocked
1009
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1009

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1008 // When block number more than endReleaseBlock, all locked ALPACAs can be unlocked
1009 else if (block.number >= endReleaseBlock) {
1010     return _locks[_account];
1011 }
1012 // When block number is more than startReleaseBlock but less than endReleaseBlock,
1013
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1016

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1015  {  
1016  uint256 releasedBlock = block.number.sub(_lastUnlockBlock[_account]);  
1017  uint256 blockLeft = endReleaseBlock.sub(_lastUnlockBlock[_account]);  
1018  return _locks[_account].mul(releasedBlock).div(blockLeft);  
1019  }  
1020
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1029

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1028  _locks[msg.sender] = _locks[msg.sender].sub(amount);
1029  _lastUnlockBlock[msg.sender] = block.number;
1030  _totalLock = _totalLock.sub(amount);
1031  }
1032
1033
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1157

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1156 function getPriorVotes(address account, uint256 blockNumber) external view returns
(uint256) {
1157     require(blockNumber < block.number, "ALPACA::getPriorVotes: not yet determined");
1158
1159     uint32 nCheckpoints = numCheckpoints[account];
1160     if (nCheckpoints == 0) {
1161
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1230

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1229     ) internal {
1230     uint32 blockNumber = safe32(block.number, "ALPACA::_writeCheckpoint: block number
exceeds 32 bits");
1231
1232     if (nCheckpoints > 0 && checkpoints[delegatee][nCheckpoints - 1].fromBlock ==
blockNumber) {
1233     checkpoints[delegatee][nCheckpoints - 1].votes = newVotes;
1234
```


SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1420

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1419     function setPool(  
1420         uint256 _pid,  
1421         uint256 _allocPoint,  
1422         bool _withUpdate  
1423     ) public override onlyOwner {  
1424
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1441

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1440 function isDuplicatedPool(address _stakeToken) public view returns (bool) {
1441     uint256 length = poolInfo.length;
1442     for (uint256 _pid = 0; _pid < length; _pid++) {
1443         if(poolInfo[_pid].stakeToken == _stakeToken) return true;
1444     }
1445 }
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1442

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1441 uint256 length = poolInfo.length;
1442 for (uint256 _pid = 0; _pid < length; _pid++) {
1443     if(poolInfo[_pid].stakeToken == _stakeToken) return true;
1444 }
1445 return false;
1446
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1508

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1507     if (block.number <= bonusEndBlock) {
1508         alpaca.lock(devaddr, alpacaReward.div(10).mul(bonusLockUpBps).div(10000));
1509         pool.accAlpacaPerShareTilBonusEnd = pool.accAlpacaPerShare;
1510     }
1511     if(block.number > bonusEndBlock && pool.lastRewardBlock < bonusEndBlock) {
1512
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1511

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1510     }
1511     if(block.number > bonusEndBlock && pool.lastRewardBlock < bonusEndBlock) {
1512         uint256 alpacaBonusPortion =
bonusEndBlock.sub(pool.lastRewardBlock).mul(bonusMultiplier).mul(alpacaPerBlock).mul(pool
.allocPoint).div(totalAllocPoint);
1513         alpaca.lock(devaddr, alpacaBonusPortion.div(10).mul(bonusLockUpBps).div(10000));
1514         pool.accAlpacaPerShareTilBonusEnd =
pool.accAlpacaPerShareTilBonusEnd.add(alpacaBonusPortion.mul(1e12).div(lpSupply));
1515     }
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1522

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1521 PoolInfo storage pool = poolInfo[_pid];
1522 UserInfo storage user = userInfo[_pid][_for];
1523 if (user.fundedBy != address(0)) require(user.fundedBy == msg.sender, "bad sof");
1524 require(pool.stakeToken != address(0), "deposit: not accept deposit");
1525 updatePool(_pid);
1526
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1526

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1525  updatePool(_pid);
1526  if (user.amount > 0) _harvest(_for, _pid);
1527  if (user.fundedBy == address(0)) user.fundedBy = msg.sender;
1528  IERC20(pool.stakeToken).safeTransferFrom(address(msg.sender), address(this),
_amount);
1529  user.amount = user.amount.add(_amount);
1530
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1527

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1526 if (user.amount > 0) _harvest(_for, _pid);
1527 if (user.fundedBy == address(0)) user.fundedBy = msg.sender;
1528 IERC20(pool.stakeToken).safeTransferFrom(address(msg.sender), address(this),
_amount);
1529 user.amount = user.amount.add(_amount);
1530 user.rewardDebt = user.amount.mul(pool.accAlpacaPerShare).div(1e12);
1531
```


SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1534

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1533     }  
1534  
1535     // Withdraw Staking tokens from FairLaunchToken.  
1536     function withdraw(address _for, uint256 _pid, uint256 _amount) public override {  
1537         _withdraw(_for, _pid, _amount);  
1538     }
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1540

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1539
1540 function withdrawAll(address _for, uint256 _pid) public override {
1541     _withdraw(_for, _pid, userInfo[_pid][_for].amount);
1542 }
1543
1544
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1551

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- AlpacaToken.sol

Locations

```
1550  _harvest(_for, _pid);
1551  user.amount = user.amount.sub(_amount);
1552  user.rewardDebt = user.amount.mul(pool.accAlpacaPerShare).div(1e12);
1553  user.bonusDebt = user.amount.mul(pool.accAlpacaPerShareTilBonusEnd).div(1e12);
1554  if (pool.stakeToken != address(0)) {
1555
```

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