



What is contract verification



Contract creation code

On-chain creation code

Oscilla creation cod









solc-v0.8.26





solc-v0.8.26

```
{
    "optimizer": {
        "enabled": true,
        "runs": 1
}
```

```
Fil Blockscout
```

```
contract TrickyStorage_1 {
   uint256 value;
   function store(uint256 new_value) external {
      value = new_value + 42;
   }
}
```

```
{
    "optimizer": {
         "enabled": true,
          "runs": 1
}
```

```
ii Blockscout
```

```
contract TrickyStorage_1 {
   uint256 value;
   function store(uint256 new_value) external {
      value = new_value + 42;
   }
}
```

```
{
    "optimizer": {
         "enabled": true,
          "runs": 1
    }
}
```

Combine into Standard Json Input

```
Fi Blockscout
```

```
contract TrickyStorage_1 {
   uint256 value;
   function store(uint256 new_value) external {
      value = new_value + 42;
   }
}
```

```
{
    "optimizer": {
         "enabled": true,
          "runs": 1
    }
}
```

```
Combine into Standard Json Input
```

"language": "Solidity",
"sources": {
 "contracts/TrickyStorage-1.sol": {
 "content": "contract TrickyStorage_1 ..."

solc-v0.8.26 --standard-json



```
contract TrickyStorage_1 {
   uint256 value;

function store(uint256 new_value) external {
     value = new_value + 42;
   }
}
```

```
{
    "optimizer": {
        "enabled": true,
        "runs": 1
}
```

```
Combine into 
Standard Json Input
```

solc-v0.8.26 --standard-json



Standard Json Output



Compiled Creation Code

 $0\times6080604052348015600e575f80fd5b5060b980601a5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e01c8\\0636057361d14602a575b5f80fd5b603960353660046049565b603b565b005b604481602a605f565b5f5550565b5f602082840312156058\\575f80fd5b5035919050565b80820180821115607d57634e487b7160e01b5f52601160045260245ffd5b9291505056fea26469706673582\\212201ed0d03edb7667e64bcabfcbad977c32d6299a98747650fe0a9ed6a8f181ae1664736f6c634300081a0033$



On-chain Creation Code

 $0\times6080604052348015600e575f80fd5b5060b980601a5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e01c8\\0636057361d14602a575b5f80fd5b603960353660046049565b603b565b005b604481602a605f565b5f5550565b5f602082840312156058\\575f80fd5b5035919050565b80820180821115607d57634e487b7160e01b5f52601160045260245ffd5b9291505056fea26469706673582\\212201ed0d03edb7667e64bcabfcbad977c32d6299a98747650fe0a9ed6a8f181ae1664736f6c634300081a0033$



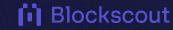
Compiled Creation Code

 $0 \times 6080604052348015600e575f80fd5b5060b980601a5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e01c8\\0636057361d14602a575b5f80fd5b603960353660046049565b603b565b005b604481602a605f565b5f5550565b5f602082840312156058\\575f80fd5b5035919050565b80820180821115607d57634e487b7160e01b5f52601160045260245ffd5b9291505056fea26469706673582\\212201ed0d03edb7667e64bcabfcbad977c32d6299a98747650fe0a9ed6a8f181ae1664736f6c634300081a0033$

Verified

On-chain Creation Code

 $0\times6080604052348015600e575f80fd5b5060b980601a5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e01c8\\0636057361d14602a575b5f80fd5b603960353660046049565b603b565b005b604481602a605f565b5f5550565b5f602082840312156058\\575f80fd5b5035919050565b80820180821115607d57634e487b7160e01b5f52601160045260245ffd5b9291505056fea26469706673582\\212201ed0d03edb7667e64bcabfcbad977c32d6299a98747650fe0a9ed6a8f181ae1664736f6c634300081a0033$



Contract creation code

Verify & publish

0x6080604052348015600e575f80fd5b506101188061001c5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e1c80636657361114602a575b5f80fd5b6039603536600460b6565b603965b005b60405f62ad00899b6060401b8f5260048101829052602a602482015273513ddfe9cdfcc551a40880f956477ce7df52887e9063cad0899b96064d10602060405180830381865af4158015608f573 d3f803a345ffd5b50550550604051366011960118201168201180604055250810190600c565b5f5550565b5f6002082840312156005557f80fd5b50355919050565b5f60208284031215600557680fd5b50356740804709042c233565023507b098002c152e65efdf1c9417afccd70d26ca664736f6c6343000081a0033

Deployed ByteCode

0x6080604052348015600e575f80fd5b50600436106026575f3560e01c8063657361d14602a575b5f80fd5b6039603536600460b6565b603b565b005b60405163cad0899b60e01b8152600481018290526
02x602482015273513ddfebcdfcc551a4088bf956477ce7/3f52887e9063cad0899b9904401602060405180830381865af4158015608f573d5f803a3dffd5b5050505606040513d601f19601f820180604
05258081019060b1919060cc565b5f555056b5b16020828403121560c5575f80fd5b505591905056b5f6020828403121560d5575f80fd5b505191905056fea264697066735822122036cbbd47009d2c233e50a
23cc7be08b002cf52e65efdfdfe9df7afccd70df2cab64736f6c63430008180033

• • •

```
library SafeMath {
    function sum(uint256 a, uint256 b) external pure returns (uint256) {
        return a + b;
    }
}

contract TrickyStorage_2 {
    uint256 value;

function store(uint256 new_value) external {
        value = SafeMath.sum(new_value, 42);
    }
}
```



```
library SafeMath {
    function sum(uint256 a, uint256 b) external pure returns
(uint256) {
        return a + b;
    }
}

contract TrickyStorage_2 {
    uint256 value;

    function store(uint256 new_value) external {
        value = SafeMath.sum(new_value, 42);
    }
}
```

Combine into Standard Json Input

solc-v0.8.26 --standard-json



Standard Json Output



Compiled Creation Code

 $0 \times 6080604052348015600e575f80fd5b506101188061001c5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e\\0 1 c 80636057361d14602a575b5f80fd5b6039603536600460b6565b603b565b005b60405163cad0899b60e01b815260048101829052602a\\60 2 4 8 2 0 1 5 2 7 3 _ \$9e30dc62696a7b2364588369d98712b6df\$ _ 9063cad0899b90604401602060405180830381865af4158015608f573d5\\f80 3 e 3 d 5 f f d 5 b 5 0 5 0 5 0 5 0 5 0 6 0 4 0 5 1 3 d 6 0 1 f 19601f8201168201806040525081019060b1919060cc565b5f5550565b5f6020828403121560c5\\575 f 8 0 f d 5 b 5 0 3 5 9 1 9 0 5 0 5 6 5 b 5 f 6 0 2 0 8 2 8 4 0 3 1 2 1 5 6 0 d b 5 7 5 f 8 0 f d 5 b 5 0 5 6 5 e f d d 1 c 9 d 1 7 a 1 c c d 7 0 d 2 6 c a b 6 4 7 3 6 f 6 c 6 3 4 3 0 0 0 8 1 a 0 0 3 3$

1

match?

On-chain Creation Code

 $0 \times 6080604052348015600e575f80fd5b506101188061001c5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e\\0 1 c 80636057361d14602a575b5f80fd5b6039603536600460b6565b603b565b005b60405163cad0899b60e01b815260048101829052602a\\60 2 4 8 2 0 1 5 2 7 3 5 1 3 ddfe9cdfcc551a4088bf956477ce7d5f2887e9063cad0899b90604401602060405180830381865af4158015608f573d5\\f80 3 e 3 d5ffd5b50505050506040513d601f19601f8201168201806040525081019060b1919060cc565b5f5550565b5f6020828403121560c5\\575f80fd5b5035919050565b5f6020828403121560db575f80fd5b505191905056fea264697066735822122036cbbd47009d2c233e50a23\\cc7be08b002c152e65efdd1c9d17a1ccd70d26cab64736f6c634300081a0033$



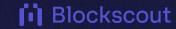
Compiled Creation Code



match?

On-chain Creation Code

A little more complex contract (4) Blockscout



Standard Json Output

```
"contracts": {
    "contracts/TrickyStorage-2.sol": {
        "TrickyStorage_2": {
            "evm": {
                "bytecode": { /*compiled creation code*/
                    "linkReferences": {
                      "contracts/TrickyStorage-2.sol": {
                        "SafeMath": [
                             "length": 20,
                            "start": 116
                    "object": "60802018..."
```

A little more complex contract (4) Blockscout



Standard Json Output

```
"contracts": {
    "contracts/TrickyStorage-2.sol": {
        "TrickyStorage_2": {
            "evm": {
                "bytecode": { /*compiled creation code*/
                    "linkReferences": {
                      "contracts/TrickyStorage-2.sol": {
                        "SafeMath": [
                             "length": 20,
                            "start": 116
                    "object": "60802018..."
```



Compiled Creation Code

On-chain Creation Code



Compiled Creation Code

116 bytes

On-chain Creation Code

 $0\times 6080604052348015600e575f80fd5b506101188061001c5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e\\01c80636057361d14602a575b5f80fd5b6039603536600460b6565b603b565b005b60405163cad0899b60e01b815260048101829052602a\\602482015273\frac{513ddfe9cdfcc551a4088bf956477ce7d5f2887e}{602482015273}9063cad0899b90604401602060405180830381865af4158015608f573d5\\f803e3d5ffd5b505050506040513d601f19601f8201168201806040525081019060b1919060cc565b5f5550565b5f6020828403121560c5\\575f80fd5b5035919050565b5f6020828403121560db575f80fd5b505191905056fea264697066735822122036cbbd47009d2c233e50a23\\cc7be08b002c152e65efdd1c9d17a1ccd70d26cab64736f6c634300081a0033$



Compiled Creation Code

116 bytes

On-chain Creation Code



Compiled Creation Code

0x6080604052348015600e575f80fd5b506101188061001c5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e
01c80636057361d14602a575b5f80fd5b6039603536600460b6565b603b565b005b60405163cad0899b60e01b815260048101829052602a
602482015273513ddfe9cdfcc551a4088bf956477ce7d5f2887e
9063cad0899b90604401602060405180830381865af4158015608f573d5
f803e3d5ffd'5b505050506040513d601f19601f8201168201806040525081019060b1919060cc565b5f5550565b5f6020828403121560c5
575f80fd5b5
35919050565b5f6020828403
21560db575f80fd5b505191905056fea264697066735822122036cbbd47009d2c233e50a23
cc7be08b002
152e65efdd1c9d17a1ccd700
6cab64736f6c634300081a0033

116 bytes

On-chain Creation Code

 $0 \times \frac{6080604052348015600e575f80fd5b5061}{01c8063604052348015600e575f80fd5b50600436106026575f3560e} \\ 0 1 c 80636057361d14602a575b5f80fd5b603}{01c80636057361d14602a575b5f80fd5b603}{0603536600460b6565b603b565b005b60405163cad0899b60e01b815260048101829052602a} \\ 602482015273513ddfe9cdfcc551a4088bf956477ce7d5f2887e} \\ 9063cad0899b90604401602060405180830381865af4158015608f573d5 \\ f803e3d5ffd5b505050506040513d601f19601f8201168201806040525081019060b1919060cc565b5f5550565b5f60208284031215600c5 \\ 575f80fd5b5035919050565b5f6020828403121560db575f80fd5b505191905056fea264697066735822122036cbbd47009d2c233e50a23 \\ cc7be08b002c152e65efdd1c9d17a1ccd70d26cab64736f6c634300081a0033$



Compiled Creation Code

 $0 \times \frac{6080604052348015600e575f80fd5b506101188061001c5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e91c80636057361d14602a575b5f80fd5b6039603536600460b6565b603b565b005b60405163cad0899b60e01b815260048101829052602a602482015273513ddfe9cdfcc551a4088bf956477ce7d5f2887e9063cad0899b90604401602060405180830381865af4158015608f573d5f803e3d5ffd5b505050506040513d601f19601f8201168201806040525081019060b1919060cc565b5f5550565b5f60208284031215600c5575f80fd5b5035919050565b5f6020828403121560db575f80fd5b505191905056fea264697066735822122036cbbd47009d2c233e50a23cc7be08b002c152e65efdd1c9d17a1ccd70d26cab64736f6c634300081a0033$



match?

On-chain Creation Code

 $0\times 6080604052348015600e575f80fd5b506101188061001c5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e\\ 01c80636057361d14602a575b5f80fd5b6039603536600460b6565b603b565b005b60405163cad0899b60e01b815260048101829052602a\\ 602482015273513ddfe9cdfcc551a4088bf956477ce7d5f2887e\\ 9063cad0899b90604401602060405180830381865af4158015608f573d5\\ f803e3d5ffd5b505050506040513d601f19601f8201168201806040525081019060b1919060cc565b5f5550565b5f6020828403121560c5\\ 575f80fd5b5035919050565b5f6020828403121560db575f80fd5b505191905056fea264697066735822122036cbbd47009d2c233e50a23\\ cc7be08b002c152e65efdd1c9d17a1ccd70d26cab64736f6c634300081a0033$



Compiled Creation Code

 $0\times \frac{6080604052348015600e575f80fd5b506101188061001c5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e91c80636057361d14602a575b5f80fd5b6039603536600460b6565b603b565b005b60405163cad0899b60e01b815260048101829052602a602482015273513ddfe9cdfcc551a4088bf956477ce7d5f2887e9063cad0899b90604401602060405180830381865af4158015608f573d5f803e3d5ffd5b505050506040513d601f19601f8201168201806040525081019060b1919060cc565b5f5550565b5f6020828403121560c5575f80fd5b5035919050565b5f6020828403121560db575f80fd5b505191905056fea264697066735822122036cbbd47009d2c233e50a23cc7be08b002c152e65efdd1c9d17a1ccd70d26cab64736f6c634300081a0033$

Verified

On-chain Creation Code

 $0 \times \frac{6080604052348015600e575f80fd5b506101188061001c5f395ff3fe6080604052348015600e575f80fd5b50600436106026575f3560e91c80636057361d14602a575b5f80fd5b6039603536600460b6565b603b565b005b60405163cad0899b60e01b815260048101829052602a602482015273513ddfe9cdfcc551a4088bf956477ce7d5f2887e9063cad0899b90604401602060405180830381865af4158015608f573d5f803e3d5ffd5b505050506040513d601f19601f8201168201806040525081019060b1919060cc565b5f5550565b5f60208284031215600c5575f80fd5b5035919050565b5f6020828403121560db575f80fd5b505191905056fea264697066735822122036cbbd47009d2c233e50a23cc7be08b002c152e65efdd1c9d17a1ccd70d26cab64736f6c634300081a0033$



Code Transformations

Actions that may be applied to the compiled code which do not affect its EVM opcodes

- Libraries
- Cbor Auxdata
- Constructor Arguments
- Immutables
- Call Protection





Code Transformations

Actions that may be applied to the compiled code which do not affect its EVM opcodes



Panel: Source Code Verification

- Nov 13th − 5:30 PM
- Stage 2
- Blockscout, Sourcify and Routescan