Rule 0.11 ⟨*Delete Unused Storage Variables*⟩

```
[...]
contract A {
  [...]
  function f(pds) {
    [...]
    var = defaultValue;
    stmts
  }
  [...]
}
```

=

```
[...]
contract A' {
  [...]
  function f(pds) {
    [...]
    delete var;
    stmts
  }
  [...]
}
```

where

var is a storage variable or storage location being reset;

defaultValue is the default zero value for the type of *var*;

stmts represents the sequence of statements following the operation;

pds are the parameter declarations of function f.

provided

var refers to a storage location (state variable, mapping entry, or array element);

The assignment *var* = *defaultValue* is semantically equivalent to **delete** *var*;

The **delete** operation triggers gas refunds in the EVM;

var is not read again within the same transaction after this operation;

The storage being cleared is no longer needed by the contract logic.

Invariant:

Let s_i and s_i' be the initial state of A and A', respectively.

Let s_f and s_f' be the state reached by A and A', respectively, after $A.f()$ and $A'.f()$ are executed from s_i and s_i', respectively.

Then, the coupling invariant is

$$\forall\, s_i, s_i' \;.\; (s_i = s_i') \rightarrow (s_f = s_f')$$