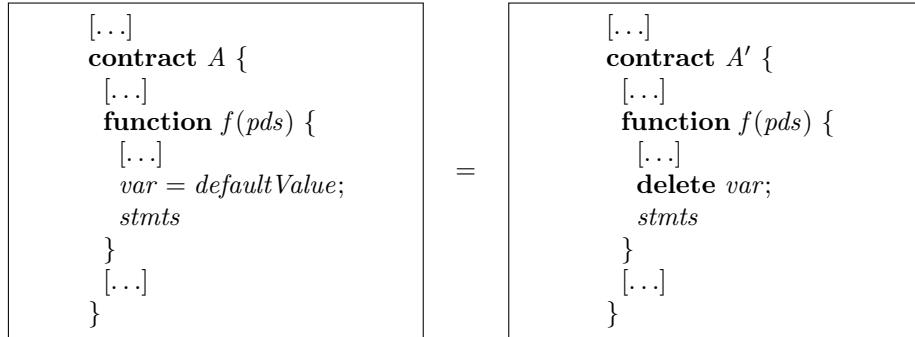


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**Rule 0.11** *(Delete Unused Storage Variables)*

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**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

$$\forall s_i, s'_i . (s_i = s'_i) \rightarrow (s_f = s'_f)$$

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