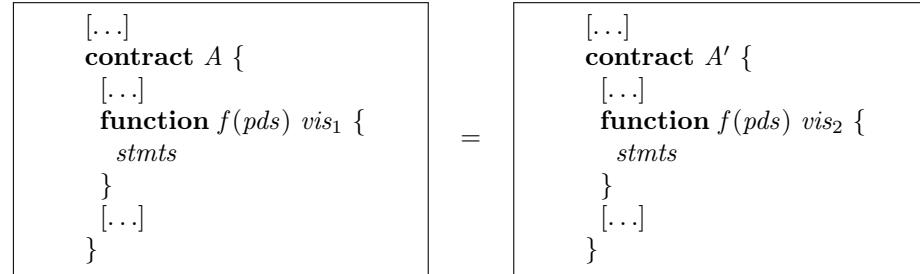

Rule 0.12 *(Use Appropriate Function Visibility)*



where

f is a function with visibility modifier *vis₁* in contract *A*;

vis₁ is the original visibility modifier (e.g., **public**);

vis₂ is the optimized visibility modifier (e.g., **external** or **internal**);

pds are the parameter declarations of function *f*;

stmts represents the function body statements.

provided

If *vis₁* = **public** and *f* is only called externally, then *vis₂* = **external**;

If *vis₁* = **public** and *f* is only called internally, then *vis₂* = **internal**;

The visibility change does not break the contract's interface or functionality;

All callers of *f* remain valid under the new visibility *vis₂*;

The function *f* with visibility *vis₂* provides the most restrictive appropriate access level.

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

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