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**Rule 0.19**  $\langle \text{Limit Number of Functions} \rangle$ 


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<pre> [...]  <b>contract</b> A {    [...]    <b>function</b> <math>f_1(pds_1)</math> {      <math>stmts_1</math>    }    <b>function</b> <math>f_2(pds_2)</math> {      <math>stmts_2</math>    }    ...    <b>function</b> <math>f_n(pds_n)</math> {      <math>stmts_n</math>    }    [...]  }</pre>	=	<pre> [...]  <b>contract</b> A' {    [...]    <b>function</b> <math>g(op, pds)</math> {      <b>if</b> (<math>op == op_1</math>) {        <math>stmts_1</math>      } <b>else if</b> (<math>op == op_2</math>) {        <math>stmts_2</math>      } ...      <b>else if</b> (<math>op == op_n</math>) {        <math>stmts_n</math>      }    }    [...]  }</pre>
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**where**

- $f_1, f_2, \dots, f_n$  are related functions in contract  $A$  with similar purposes;
- $g$  is the consolidated function in contract  $A'$  that combines the functionality;
- $op$  is an operation selector parameter (e.g., enum or integer) that determines which logic to execute;
- $op_i$  represents the selector value corresponding to function  $f_i$ ;
- $pds_i$  are the parameter declarations of function  $f_i$ ;
- $pds$  are the unified parameter declarations in function  $g$ ;
- $stmts_i$  represents the statement sequence of function  $f_i$ .

**provided**

- Functions  $f_1, \dots, f_n$  are semantically related and operate on similar data;
- The consolidated function  $g$  maintains all functionality of the original functions;
- The operation selector  $op$  unambiguously identifies which logic path to execute;
- The consolidation reduces deployment costs without sacrificing security or readability;
- Access control and validation logic remain equivalent in the consolidated version;
- The number of external function selectors is reduced, lowering contract size.

**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  $A.f_k()$  and  $A'.g(op_k, \dots)$  are executed from  $s_i$  and  $s'_i$ , respectively.
- Then, the coupling invariant is

$$\forall s_i, s'_i, k \in \{1, \dots, n\} . (s_i = s'_i) \rightarrow (s_f = s'_f)$$


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