

code is the code of function call; *param* is parameter of *code*; *func* is the caller function; *callee* is the called function.

MutateAnalyser is read/write analyser

ReturnAnalyser is return analyser

LiveAnalyser is live variable analyser

macro is the output macro of parameter for *func* function call

// Choose the macro according to de-allocation rule

```
1: procedure COMPUTEMACRO(param, code, func)
2:   callee = called function of code
3:   arg = map param to arg argument at callee
4:   // Check arg is written by callee
5:   isMutated = MutateAnalyser.isMutated(arg, callee)
6:   // Check arg is returned by callee
7:   isReturned = ReturnAnalyser.isReturn(arg, callee)
8:   // Check param is still live after code
9:   isLive = LiveAnalyser.isLive(param, code, func)

10:  // Deallocation Rule Check ()
11:  switch isMutated-isReturned-isLive do
12:    case (false - false - true)  $\vee$  (false - false - false)  $\vee$ 
13:      (true - false - false)
14:      return RETAIN
15:    case (false - true - false)  $\vee$  (true - true - false)
16:      return RESET
17:    case (false - true - true)  $\vee$  (true - true - true)
18:      return CALLER
19:    case true - false - true
20:      return CALLEE
21: end procedure
```