Princeton University
COS 217: Introduction to Programming Systems
SPARC "Leaf" Subroutine Calling Conventions

A subroutine can be a leaf subroutine only if it need not have its own stack frame. That is, only if it calls no other subroutines and defines no local variables in memory.

A leaf subroutine may use only registers o0-o5 and g0-g1.

The calling subroutine need not know that the called subroutine is a leaf subroutine.

When subroutine f calls leaf subroutine g...

In f:

(1) Store actual parameters 1 to 6 in o0-o5.

(2) Store actual parameters 7, 8, ... in memory locations o6/sp + 92, o6/sp + 96, ...

(3) Execute "call g".

Store register pc in o7.
Note: Register o7 thus stores the address of the call instruction.
Jump to the instruction at label g.

(4) But before executing the "jumped to" instruction, execute the delay instruction that follows the "call" instruction.

In g:

(5) Use formal parameters in o0-o5 and o6/sp + 92, o6/sp + 96, ... to compute return value(s).

(6) Store return values in registers o0-o5.

(7) Execute "retl" (return from leaf).

Jump to o7 + 8
Jump to the instruction after the delay instruction after the call instruction.

(8) But before executing the "jumped to" instruction, execute the delay instruction that follows the "retl" instruction, typically "nop".

In f:

(9) Retrieve g's return values from o0-o5.