

Script generated by TTT

Title: Petter: Compiler Construction (02.07.2020)  
-58: Function Call

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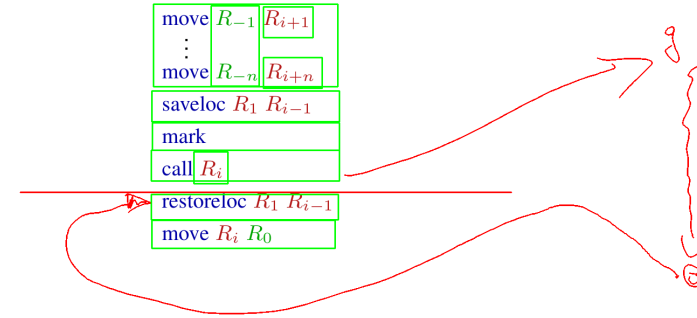
## Translation of Function Calls

A function call  $g(e_1, \dots, e_n)$  is translated as follows:

$$\text{code}_R^i \boxed{g(e_1, \dots, e_n)} \rho = \text{code}_R^i g \rho$$

$$\text{code}_R^{i+1} e_1 \rho$$

$$\vdots$$

$$\text{code}_R^{i+n} e_n \rho$$


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$$\text{move } R_{-1} R_{i+1}$$

$$\vdots$$

$$\text{move } R_{-n} R_{i+n}$$

$$\text{saveloc } R_1 R_{i-1}$$

$$\text{mark}$$

$$\text{call } R_i$$

$$\text{restoreloc } R_1 R_{i-1}$$

New instructions:

$\text{move } R_i R_0$

- $\text{saveloc } R_i R_j$  pushes the registers  $R_i, R_{i+1} \dots R_j$  onto the stack
- $\text{mark}$  backs up the organizational cells
- $\text{call } R_i$  calls the function at the address in  $R_i$
- $\text{restoreloc } R_i R_j$  pops  $R_j, R_{j-1}, \dots, R_i$  off the stack

## Rescuing the FP

The instruction  $\text{mark}$  allocates stack space for the return value and the organizational cells and backs up FP.



$S[SP+1] = FP;$   
 $SP = SP + 1;$

## Calling a Function

The instruction `call` rescues the value of `PC+1` onto the stack and sets `FP` and `PC`.

