Compilers 2014-2015
Reeks 1
Compilatie schema's

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1. Let $\rho(a) = 5$ and $\rho(b) = 6$.
   - Using the recursive compilation function code, whose definition is outlined in the accompanying compendium, determine the P-machine instruction sequence for $\text{code}_R(a + (a + (a + b)))\ \rho$
   - How many stack locations are occupied during the execution of the generated instruction sequence? Can you reduce this amount? And if so, how?

2. Suppose the type and variable declarations are given:

```
type t = record
           a: array[-5..+5,1..9] of integer
           b: ↑t
         end;
var i, j : integer;
    box  : t;
    pt   : ↑t;
```

   The first relative address to be assigned is 5, in other words, $\rho(i) = 5$. Using this assumption, compile the assignment: $pt \uparrow .a[i, j] := pt \uparrow .b \uparrow .b \uparrow .a[i, j] + box.a[0, 1]$;

3. Consider the following program for the addition of integers and compile the call of the main program.

```
program main;
  var i: integer;
  proc add (var x: integer;  value y: integer) : integer;
  begin
    var result: integer;
    result := x + y;
```

```
    return result;
  end
begin
  i := 4;
  add(i, 0 + 3)
end.
```