

Interpreter & Compiler: exercises

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Exercises for compiler

- for each in vectors (test_foreach.cre)

```
var l: array[5] of int;  
...  
for each i in v do  
  begin  
    i := n;  
    n := n - 1;  
  end;
```

Intermediate code for FOR

- Node in syntax tree For (i, 1, n, cmd)
- Generated code (gencommand in commands.ml)

```
startfor:  CG      increg      n   tmp      // tmp = (increg > n)
           JNE     tmp         0   endfor  // if (increg > n) then jump
           ...                                     // code generated for cmd
           ADD     increg      1     tmp
           CPY     tmp         NULL  increg
           GOTO   startfor    NULL  NULL
endfor:    ...
```

Intermediate code for FOR EACH

- Node in syntax tree `Foreach (e, v, cmd)`
- Lower bound `start=0`
- Upper bound `finish= dim-1`
- Take a new `increg = start`
- start loop (`increg <= finish`)
- $e \leftarrow v[\text{increg}]$
- generate commands for `cmd`
- $v[\text{increg}] \leftarrow e$
- $\text{increg} \leftarrow \text{increg} + 1$
- end loop