Interpreter & Compiler: exercises

Lectures 14-15-16

Formal Languages and Compilers 2011

Nataliia Bielova

Exercises for compiler

- for each in vectors (test_foreach.cre)

```
var 1: 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 ← v[increg]

- generate commands for cmd

- v[increg] ← e

- increg ← increg +1

- end loop