

Recitation 16: Interpreters

22

$11 + 11$

$11 * 3$

$(10 + 5) * 7$

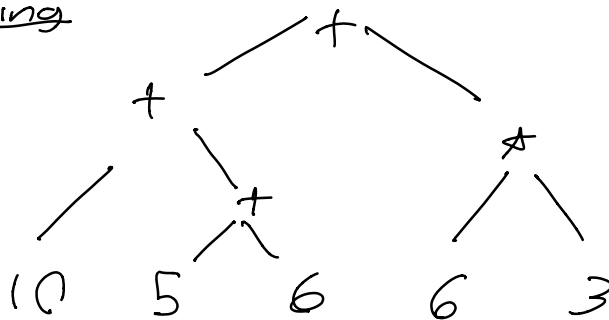
$10 + 2 * 3 = 16$

$10 + (5 + 6) + 6 * 3$

Lexing

$10 + (5 + 6) + (6 * 3)$

Parsing



Abstract
Syntax
tree

Evaluation

type bop = Add | Mult

type expr =

| Int of int

| Binop of bop * expr * expr

\hookrightarrow let rec eval (e: expr) \rightarrow int =
 match e with
 | Int n \rightarrow n
 | Binop (op, e1, e2) \rightarrow
 match op with
 | Add \rightarrow (eval e1) + (eval e2)
 | Mult \rightarrow (eval e1) * (eval e2)

wrong syntax!
should be
(e: expr): int =

Eval

C: yacc

Parser

Menhir: parser generator

ocamlyacc

Menhir

.mly \rightarrow .ml

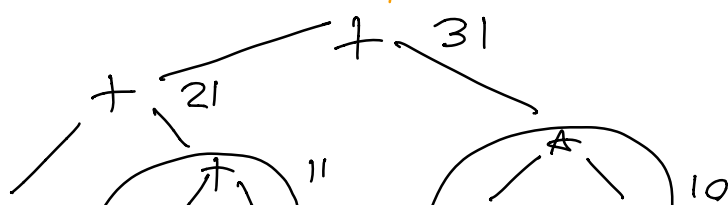
Lexer

ocamllex

.mll \rightarrow .ml

1 0 . + (5 + 6) - + - 5 * 2
 ↑ ↑ ↑ ↑ ↑
 Lexing

(10 + (5 + 6)) + 5 * 2



Parse

$$10 \quad (5 \quad 6) \quad (5 \quad 2)$$