

Today: 10/07-08/2014

- Prelim Recap
- Parsing and ASTs
- Pretty-Printing

56892
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Reminders:

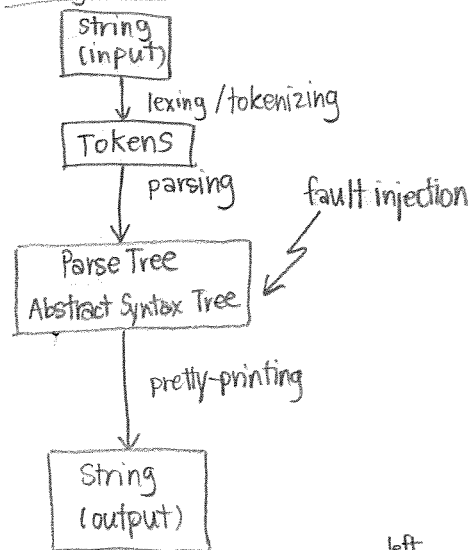
- A4 overview due W
- Fall break next T
- no recitation
- No recitation next W
- office hours
- A4 due R 10/16
- Drop deadline F 10/10/17

Prelim Recap:

1b 1f 1g

5a 5c 5d 5e

Parsing and Pretty-Printing



Ex, $E \rightarrow T \mid E - T$ left recursive
(T | T-T | T-T-T | ...)

$T \rightarrow F \mid F \wedge T$

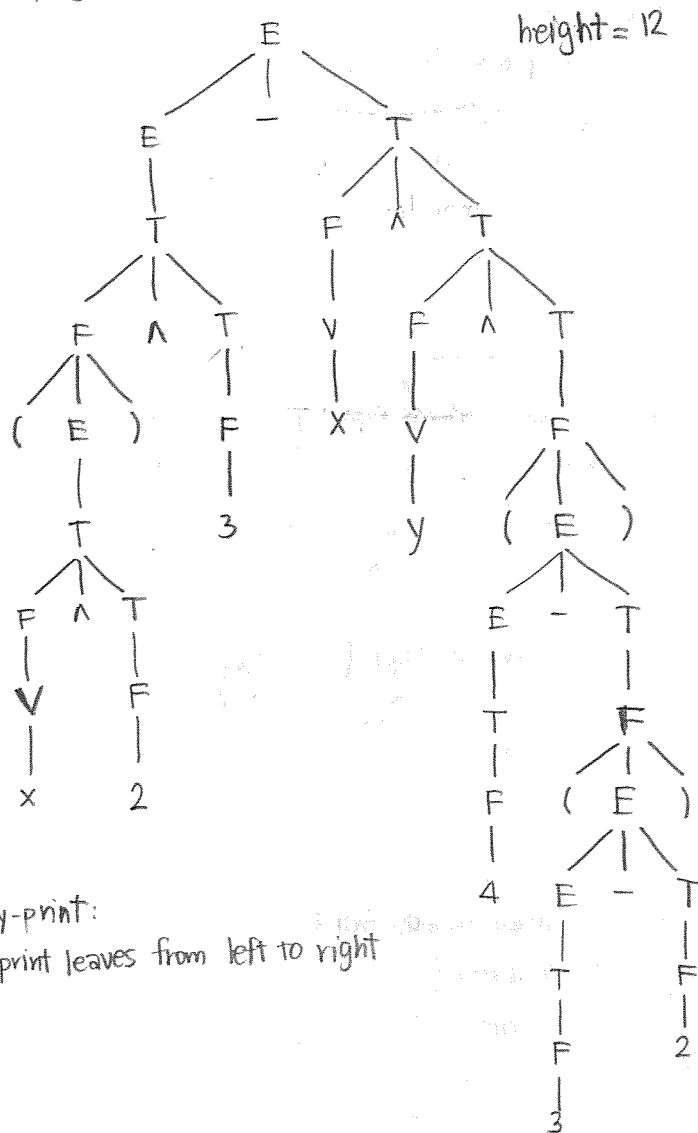
$F \rightarrow n \mid V \mid (E)$

$V \rightarrow a \mid aV$ ← can use tokenizer

Ex, $(x^2)^3 - x^4 y^{4-(3-2)}$

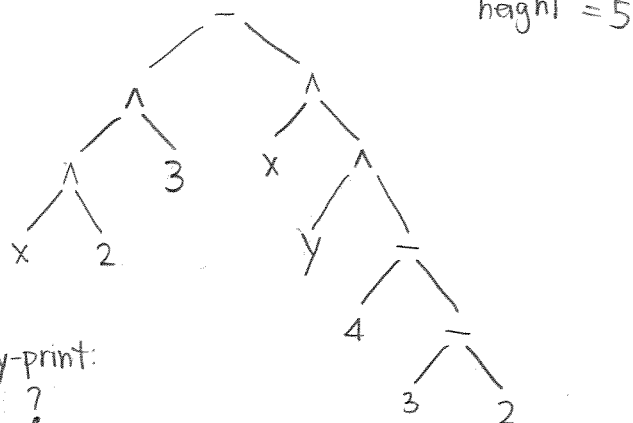
$(x^2)^3 - x^{4-(3-2)}$

parse tree:



> pretty-print:
print leaves from left to right

abstract syntax tree:



> pretty-print:
?

```

Expr parseE() {
  if (isNum(peek())) { ... }
  else if (isChar(peek())) { return parseV(); }
  else {
    consume("(");
    Expr e = parseE();
    consume(")");
    return e;
  }
}
  
```

```

Expr parseV() {
    String v = "";
    while (isChar(peek()))
        v += consume();
    return new Var(v);
}

```

Pretty-printing AST

```

class Number extends Expr {
    void pp() {
        print n;
    }
}

```

```

class Var extends Expr {
    void pp() {
        print v;
    }
}

```

```

class Binary extends Expr {
    void pp() {
        print "(";
        left.pp();
        print op;
        right.pp();
        print ")";
    }
}

```

Digression:

$LL(1)$ \swarrow our grammar
 $\uparrow \uparrow \uparrow$
 1 token of lookahead
 leftmost derivation
 read input left to right

$LR(1)$

$E \rightarrow E - T$

\uparrow
 rightmost derivation