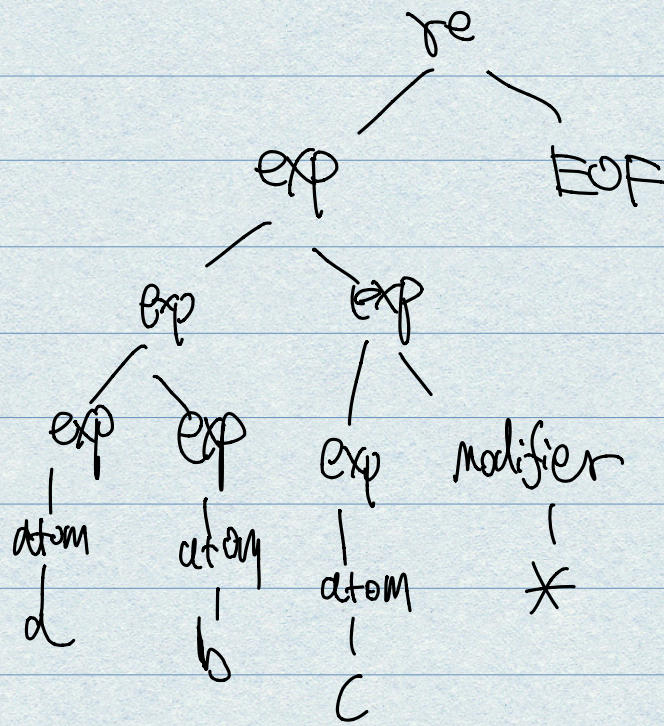


## #Quiz 4.



option  $\langle \text{assoc} = \text{right} \rangle$ .

## # Exercise Parse for Arithmetic.

Parsing with ANTLR  
Exercise: Parse Trees for Arithmetic

```
grammar ambiguity1;
expr : INT
    | <assoc=right> expr '^' expr
    | expr '*' expr
    | expr '+' expr;
INT : [0-9]+;
```

```
grammar ambiguity2;
expr : expr '+' expr
    | expr '*' expr
    | expr '^' expr
    | INT;
INT : [0-9]+;
```

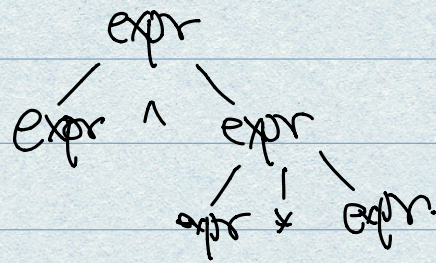
For each grammar above, draw parse trees for the following inputs:

- $1 + 2 * 3 + 1$
- $2 ^ 2 ^ 2$
- $2 ^ 2 * 3 ^ 1$

grammar 1 :

$2 ^ 2 * 3 ^ 1$





$2^2^2$

