

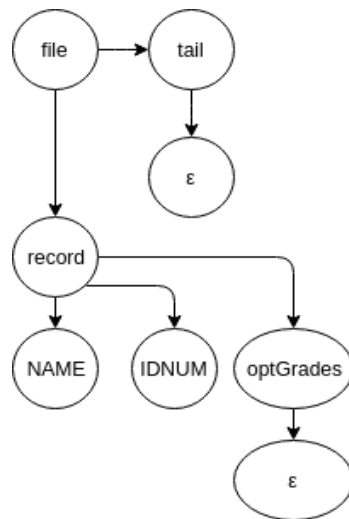
Homework 6

Question 1

a.

i. NAME IDNUM EOF

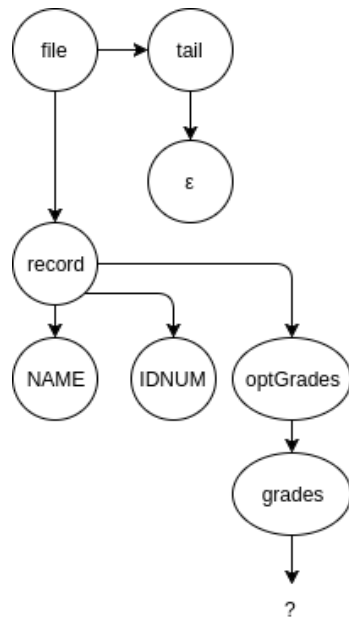
ii.



b.

i. NAME IDNUM INTLIT EOF

ii.



- iii. A predictive parser would not know which rule to proceed with once it reaches “grades”. This is because both productions for “grades” begin with the same nonterminal, “oneGrade”, and therefore the same FIRST set. Left factoring would fix this case.

c. We must fix the productions for “grades”:

grades \rightarrow oneGrade | oneGrade COMMA grades

After left factoring:

grades \rightarrow oneGrade grades'
grades' \rightarrow COMMA grades
| ϵ

d. We must fix the productions for “stars”:

stars \rightarrow STAR | stars STAR

After removing left recursion:

stars \rightarrow STAR stars'
stars' \rightarrow STAR stars'
| ϵ

Question 2

program -> { stmts } EOF

stmts -> stmt stmts

 | epsilon

stmt -> ID = exp ;

 | IF (exp) stmt

exp -> ID tail

tail -> + exp

 | - exp

 | epsilon

Nonterminal	First	Follow
program	{	EOF
stmts	ID, IF, epsilon	}
stmt	ID, IF	ID, IF, }
exp	ID	;,)
tail	+, -, epsilon	;,)