第三次作业：

1. FIRST(X) = FIRST(T_1) = {a, ε}

2. P104/3.10：

FIRST(D) = FIRST(T) = {int, real}, FIRST(L) = {id}

FIRST(R) = {,, ε}

FOLLOW(D) = {$}

FOLLOW(T) = {id}

FOLLOW(L) = {$}

FOLLOW(R) = {$}

	int	real	id	,	$
D	D→TL	D→TL			
T	T→int	T→real			
L			L→idR		
R				R→,idR	R→ε

P104:

3.12.

FIRST(S) = {x, d, ε}　FOLLOW(S) = {$}

FIRST(A) = {x}　FOLLOW(A) = {b}

FIRST(B) = {b}　FOLLOW(B) = {$}

FIRST(P) = {d, ε}　FOLLOW(P) = {a, ε}

FIRST(Q) = {a, ε}　FOLLOW(Q) = {x}

对于 P→dP|ε，FIRST(dP) = {d}　{d} ∩ {ε} = ∅

FIRST(ε) = {ε}

对于 Q→aQ|ε　FIRST(aQ) = {a}　{a} ∩ {ε} = ∅

FIRST(ε) = {ε}

对于 S→AB|PQx，FIRST(AB) = {x}

FIRST(PQx) = {a, d, x}

FIRST(AB) ∩ FIRST(PQx) ≠ ∅

故该文法不是LL(1)文法

3.16

(a) $S \Rightarrow_{rm} (L) \Rightarrow_{rm} (L,S) \Rightarrow_{rm} (L,(L)) \Rightarrow_{rm} (L,(L,S))$

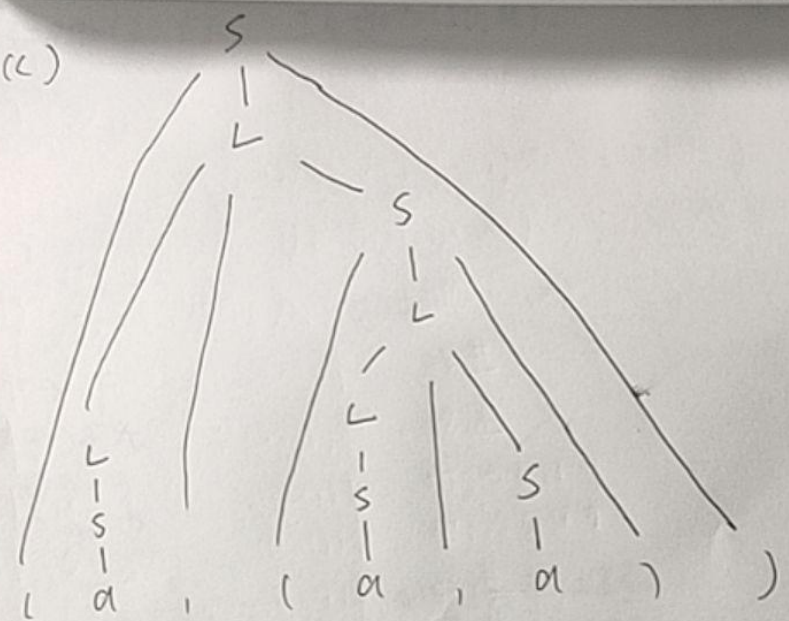
$\Rightarrow_{rm} (L,(L,a)) \Rightarrow_{rm} (L,(S,a)) \Rightarrow_{rm} (L,(a,a))$

$\Rightarrow_{rm} (S,(a,a)) \Rightarrow_{rm} (a,(a,a))$

(b)

栈	输入	动作
$	(a,(a,a))$	移进
$(	a,(a,a))$	移进
$(a	,(a,a))$	按S→a归约
$(S	,(a,a))$	按L→S归约
$(L	,(a,a))$	移进
$(L,	(a,a))$	移进
$(L,(	a,a))$	移进
$(L,(a	,a))$	按S→a归约
$(L,(S	,a))$	按L→S归约
$(L,(L	,a))$	移进
$(L,(L,	a))$	移进
$(L,(L,a	))$	按S→a归约
$(L,(L,S	))$	按L→L,S归约
$(L,(L	))$	移进
$(L,(L)	)$	按S→(L)归约
$(L,S	)$	~~移进~~ 按L→L,S归约
$(L	)$	移进
$(L)	$	按S→(L)归约
$S	$	接受.

(c)



4.

P104. 3.19 (a)

构造拓广文法：

E'→E

E→E+T | T

T→TF | F

F→F* | a | b

I0：E'→·E
E→·E+T
E→·T
T→·TF
T→·F
F→·F*
F→·a
F→·b

I1=goto(I0,E)：
E'→E·
E→E·+T

I2=goto(I0,T)：
E→T·
T→T·F
F→·F*
F→·a
F→·b

$I_3 = goto(I_0, F)$:

$T \to F \cdot$

$F \to F \cdot *$

$I_4 = goto(I_0, a)$:

$F \to a \cdot$

$I_5 = goto(I_0, b)$

$F \to b \cdot$

$I_6 = goto(I_1, +)$:

$E \to E+ \cdot T$

$T \to \cdot TF$

$T \to \cdot F$

$F \to \cdot F*$

$F \to \cdot a$

$F \to \cdot b$

$I_7 = goto(I_2, F)$:

$T \to TF \cdot$

$F \to F \cdot *$

$goto(I_2, a) = I_4$

$goto(I_2, b) = I_5$

$I_8 = goto(I_3, *)$:

$F \to F* \cdot$

$I_9 = goto(I_6, T)$:

$E \to E+T \cdot$

$T \to T \cdot F$

$F \to \cdot F*$

$F \to \cdot a$

$F \to \cdot b$

$goto(I_6, F) = I_3$

$goto(I_6, a) = I_4$

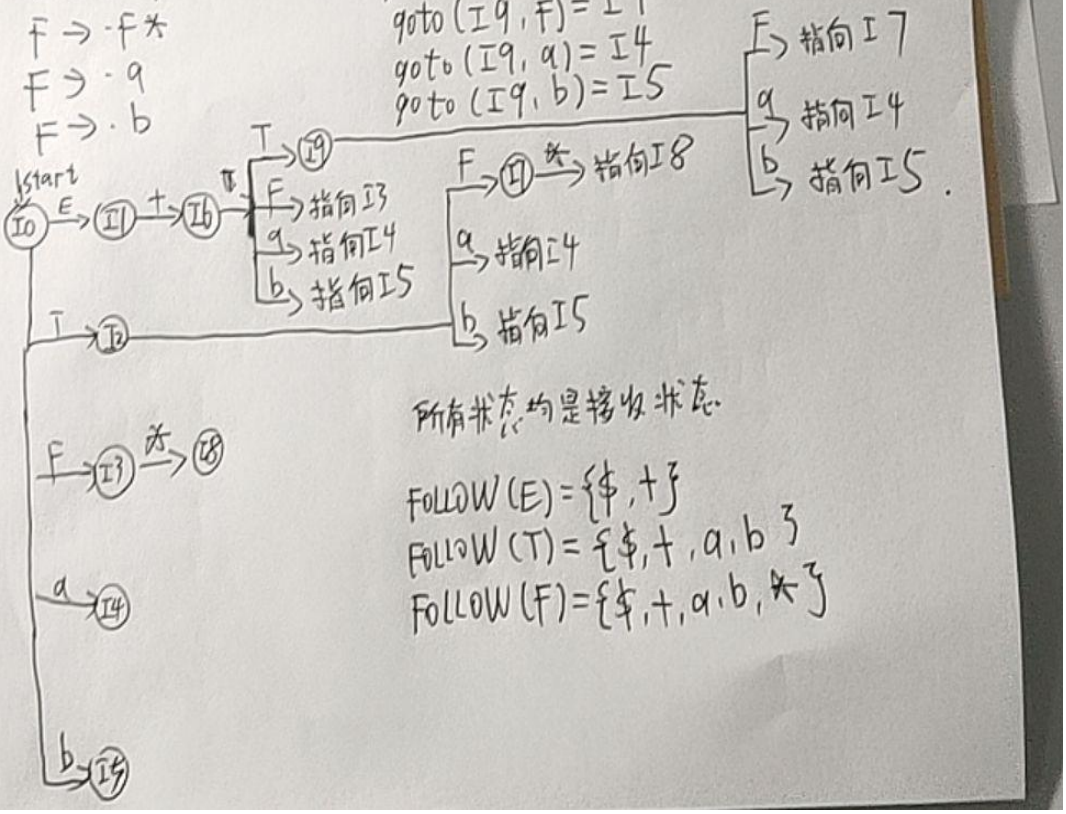
$goto(I_6, b) = I_5$

$goto(I_7, *) = I_8$

$goto(I_9, F) = I_7$

$goto(I_9, a) = I_4$

$goto(I_9, b) = I_5$



所有状态均是接收状态.

FOLLOW(E) = {$, +}

FOLLOW(T) = {$, +, a, b}

FOLLOW(F) = {$, +, a, b, *}

	+	*	a	b	$	E	T	F
0			s4	s5		1	2	3
1	s6				acc			
2	r2		s4	s5	r2			7
3	r4	s8	r4	r4	r4			
4	r6	r6	r6	r6	r6			
5	r7	r7	r7	r7	r7			
6			s4	s5			9	3
7	r3	s8	r3	r3	r3			
8	r5	r5	r5	r5	r5			
9	r1		s4	s5	r1			7

(1) $E \to E+T$ (2) $E \to T$ (3) $T \to TF$ (4) $T \to F$

(5) $F \to F*$ (6) $F \to a$ (7) $F \to b$