Homework 3.

3.27.

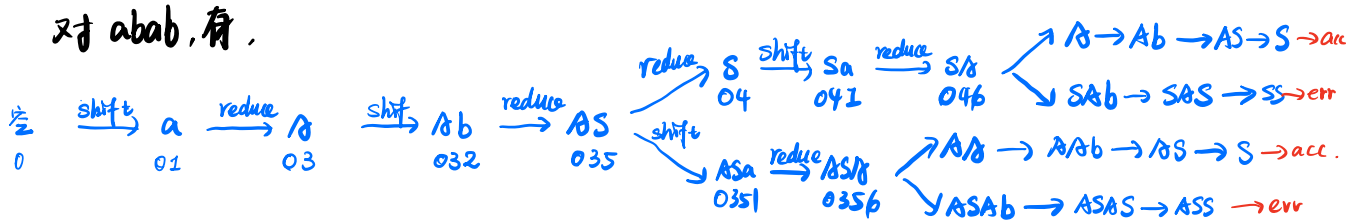
1. S: float 或 int.
   I: int
   R: float.
   W: float 整数部分
   F: float 小数部分.

2. 不是，当任意读字从S出发，只向前看一个不知进入I还是R。

3.37.

条目 I_5, I_6 存在，移入/归约冲突，因为 Follow(A) = Follow(B) = {a, b, $}

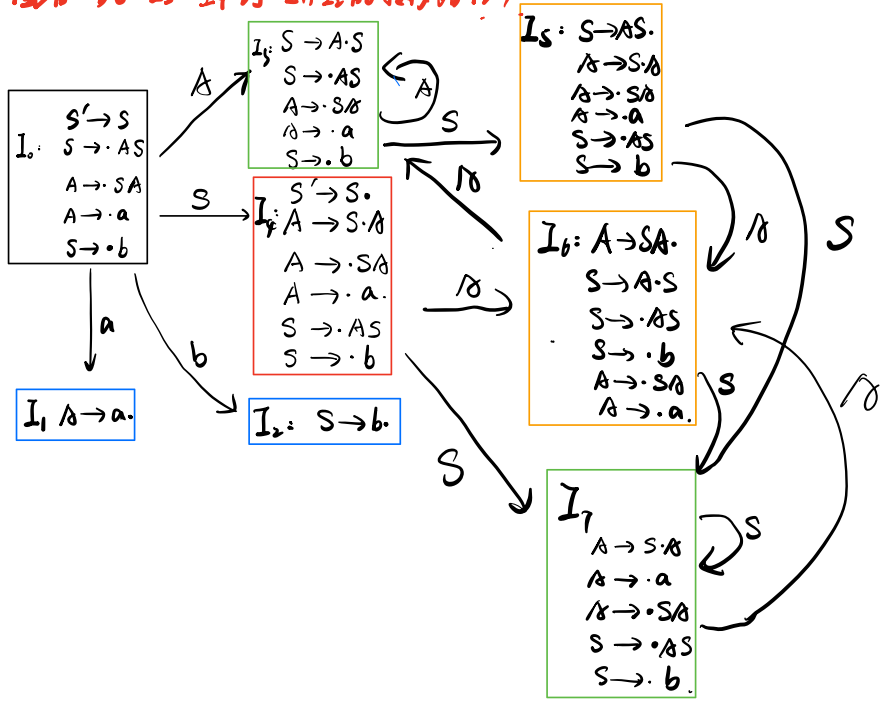
对 abab，有，



	a	b	$	B	S
0	S_1	S_2		3	4
1	r_4	r_4			
2	r_2	r_2			
3	S_1	S_2		5	
4	S_1	S_2	Acc	6	7
5	S_1/r_1	S_2/r_1	r_1	6	7
6	S_1/r_3	S_2/r_3	r_3	3	7
7	S_1	S_2		6	7

r_1 S→AS
r_2 S→b
r_3 A→SB
r_4 B→a

〈下图省略了 $I_3 \sim I_7$ 到 I_1, I_2 的转移路径〉



4.3.

$S' \to S$ { print(S.cnt) }
$S \to (L)$ { S.cnt = L.cnt + 1 }
$S \to a$ { S.cnt = 0 }
$L \to L_1, S$ { L.cnt = L_1.cnt + S.cnt }
$L \to S$ { L.cnt = S.cnt }

(b). $S' \to S$ { print(S.dep) }
$S \to (L)$ { S.dep = L.dep + 1 }
$S \to a$ { S.dep = 0 }
$L \to L_1, S$ { L.dep = max{ L_1.dep, S.dep } }
$L \to S$ { L.dep = S.dep }

4.5. $S' \to S$ { print (S.cnt) }

$S \to E$ { S.cnt = E.cnt }

$E \to$ while E_1 do E_2 { E.cnt = max(E_1.cnt, E_2.cnt) + 1 }

$E \to id := E_1$ { E.cnt = E.cnt }

$E \to E_1 + E_2$ { E.cnt = max(E1.cnt, E2.cnt) }

$E \to id$ { E.cnt = 0 }

$E \to (E_1)$ { E.cnt = E_1.cnt }

4.9. (a) 定义综合属性 val 和 len

$S \to L_1 . L_2$ { S.val = L_1 + L_2.val × $2^{-L_2.len}$ }
$S \to L$ { S.val = L.val }
$L \to L_1 B$ { L.val = L_1.val × 2 + B ; L.len = L_1.len + 1 }
$L \to B$ { L.val = B.val ; L.len = 1 }
$B \to 0$ { B.val = 0 }
$B \to 1$ { B.val = 1 }

(b). 改写文法.

$S \to L.R \mid L$
$L \to BL \mid B$
$R \to RB \mid B$
$B \to 0 \mid 1$.

设 B 的继承属性为 i,

$S \to L.R$ { S.val = L.val + R.val }
$S \to L$ { S.val = L.val }

$L \to B$ { B.i = L.c × 2 } L_1 { L.c = L_1.c × 2 ; L.val = L_1.val × 2 + B.c }
$L \to B$ { B.i = 1 ; L.c = 1, L.val = B.c }

$R \to R_1 B$ { B.i = R_1.c / 2 ; R.c = R_1.c / 2 ; R.val = R_1.val + B.c / 2 }
$R \to B$ { B.i = 0.5 ; R.c = 0.5 ; R.val = B.c }

$B \to 0$ { B.c = 0 }
$B \to 1$ { B.c = 1 }