1.

variables	Stack ←bottom, top→	Input	Action
	০	Id * id + id * id$	
S=০, a=id	০ id ৪	* id + id * id$	s৪
S=৪, a=*	0 F 3	* id + id * id$	r৬
S=৩, a=*	০ F ৩ * ৬	Id + id * id$	s৬
S=৬, a=id	০ F ৩ * ৬ id ৪	+ id * id$	s৪
S=৪, a=+	0 F 3 * 6 F 3	+ id * id$	r৬
S=৩, a=+	0 F 3 * 6 T 8	+ id * id$	r৭
S=৫, a=+	0 T 2	+ id * id$	r৪
S=২, a=+	০ T ২ + ৭	Id * id$	s৭
S=৭, a=id	০ T ২ + ৭ id ৪	* id$	s৪
S=৪, a=*	0 T 2 + 5 F 3	* id $	r৬
S=৩, a=*	০ T ২ + ৭ F ৩ * ৬	Id $	s৬
S=৬, a=id	০ T ২ + ৭ F ৩ * ৬ id ৪	$	s৪
S=৪, a=$	0 T 2 + 5 F 3 * 6 F 3	$	r৬
S=৩, a=$	0 T 2 + 5 F 3 * 6 T 8	$	r৭
S=৫, a=$	0 T 2 + 5 T 2	$	r৪
S=২, a=$	0 T 2 + 5 E 7	$	r৩
S=৩, a=$	0 E 1	$	r২
S=১, a=$			accept

2. (see last page)

3. FIRST(Es) = {atom, ', (, $}
FOLLOW(E) = {$$, $, atom, ', (,)}
PREDICT(Es → ∈) = FOLLOW(Es) = {), $}

4. B → T B'
B' → or T B'
| ε
T → C T'
T' → and C T'
| ε
C → not C
| (B)
| true
| false

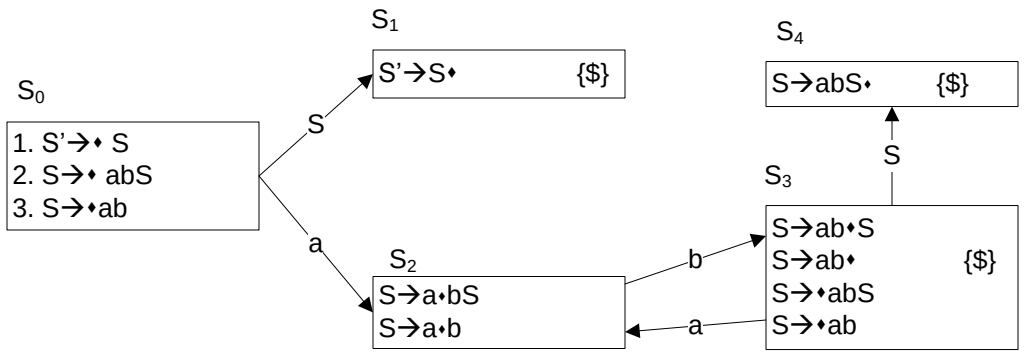
predict(B → T B') = FIRST(T) = {not, (, true, false}
predict(B' → or T B') = {or}
predict(B' → ε) = FOLLOW(B') = {$,)}
predict(T → C T') = {not, (, true, false}
predict(T' → and C T') = {and}
predict(T' → ε) = FOLLOW(T') = {$,)}
predict(C → not C) = {not}
predict(C → (B)) = {(}
predict(C → true) = {true}
predict(C → false) = {false}

5.

```
S(){
        if(token == PLUS || token == MINUS || token == a) then
        {
                ptoken = token;
                token = NextToken();
                if(ptoken == a)
                   return OK;
                else if(S() == ERROR) then
                   return ERROR;
                else
                   return T();
        }
        else return ERROR;
   }
T(){
        if(token == DIV || token == MUL || token == b) then
        {
                ptoken = token;
                token = NextToken();
                if(ptoken == b)
                   return OK;
                else return S() ;
        }
        else return ERROR;
   }
```

Andrew Rothwell

a.

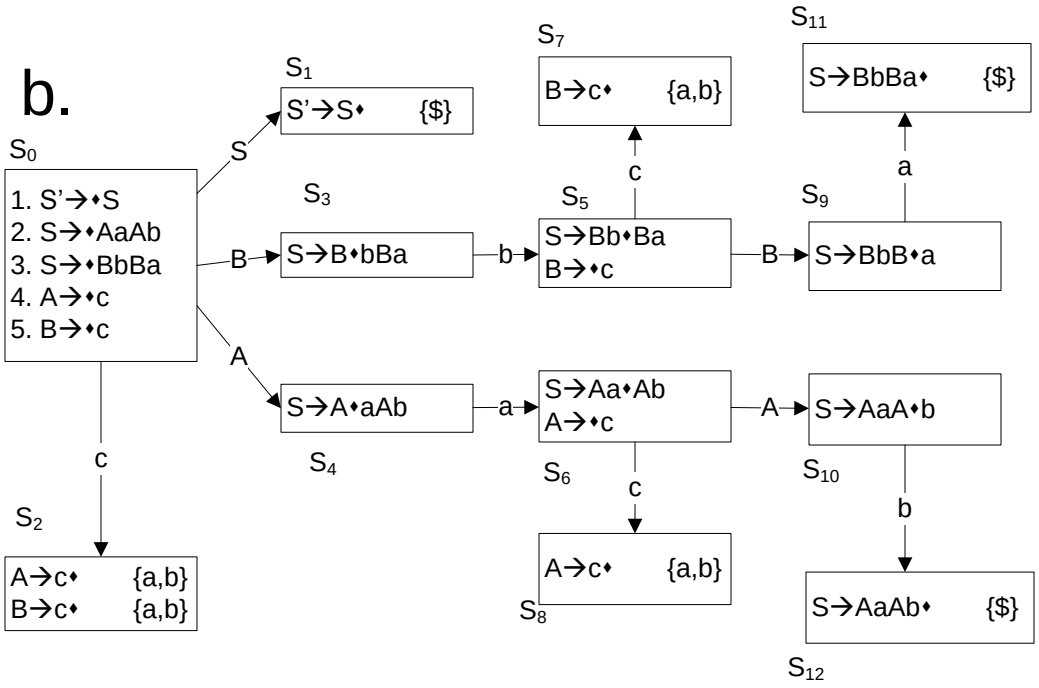


Follow(S') = {$}
Follow(S) = {$}

	Action			GOTO
	a	b	$	S
s_0	s2			1
s_1			!	
s_2		s3		
s_3	s2		r3	4
s_4			r2	

YES! this is SLR: no conflicts found!

b.

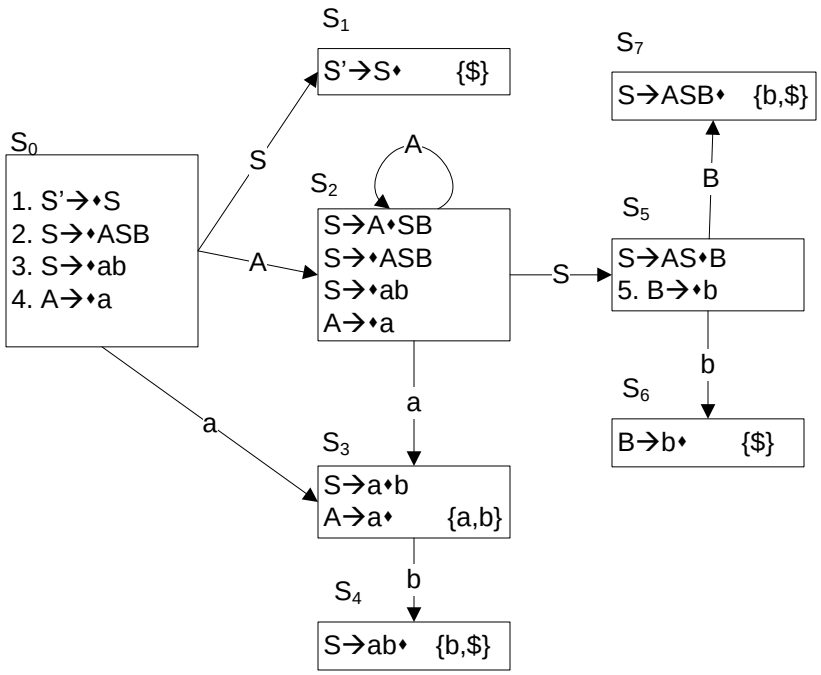


Follow(S') = {$}
Follow(S) = {$}
Follow(A) = {a,b}
Follow(B) = {a,b}

	Action				GOTO		
	a	b	c	$	S	A	B
s_0			s2		1	4	3
s_1				!			
s_2	r4/r5	r4/r5					
s_3		s5					
s_4	s6						
s_5			s7				9
s_6			s8			10	
s_7	r5	r5					
s_8	r4	r4					
s_9	s11						
s_{10}	s12						
s_{11}				r3			
s_{12}				r2			

No! this is not SLR: reduce-reduce conflict at state s2

c.



Follow(S') = {$}
Follow(S) = {b,$}
Follow(A) = {a,b}
Follow(B) = {$}

	Action			GOTO		
	a	b	$	S	A	B
s_0	s3			1	2	
s_1			!			
s_2	s3			5	2	
s_3	r4	s4/r4				
s_4		r3	r3			
s_5		s6				7
s_6			r5			
s_7		r2	r2			

No! this is not SLR: shift-reduce conflict at state s3