

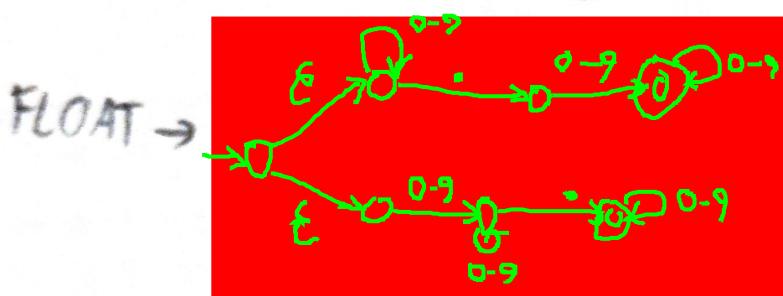
① a)  $ID \rightarrow [a-zA-Z][a-zA-Z0-9]^*$

FLOAT  $\rightarrow [0-9]^*.[0-9]^+ | [0-9]^+. [0-9]^*$

NUM  $\rightarrow [0-9]^+$

OCTAL  $\rightarrow 0[0-7]^+$

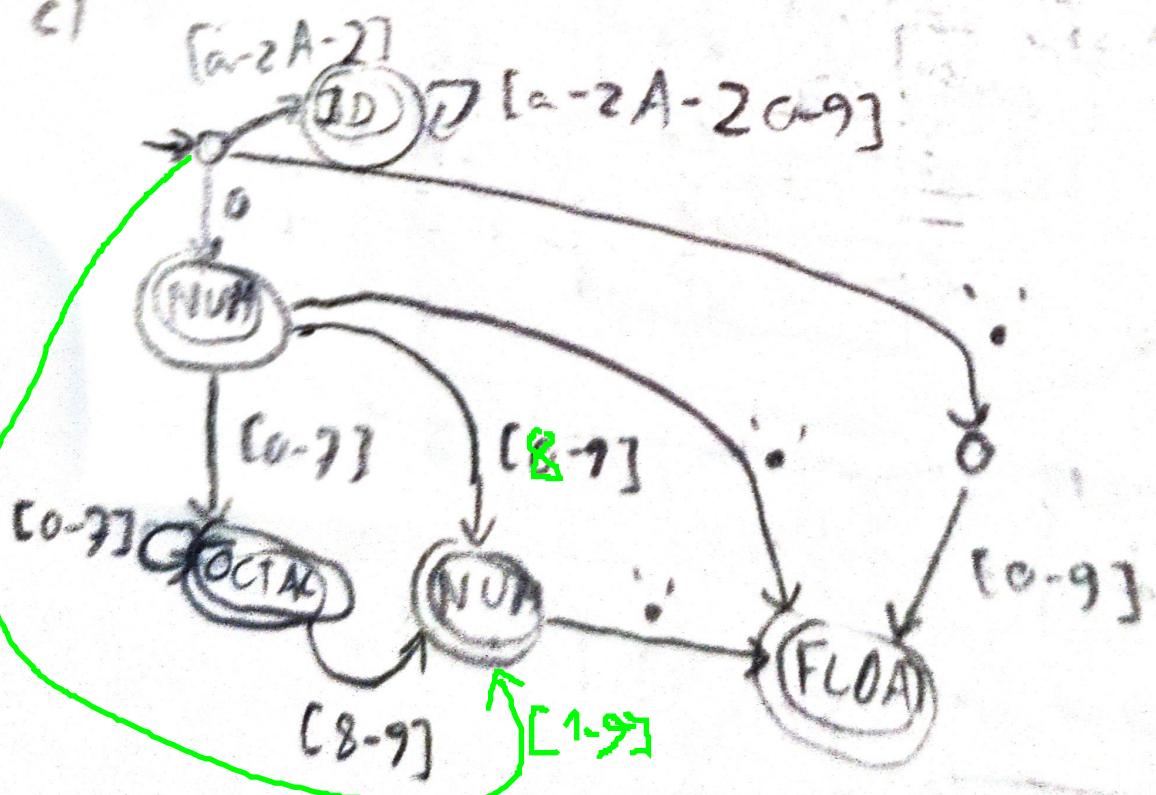
b)  $ID \rightarrow \xrightarrow{[a-zA-Z]} @P [a-zA-Z0-9]$



NUM  $\rightarrow \xrightarrow{[0-9]} @P [0-9]$

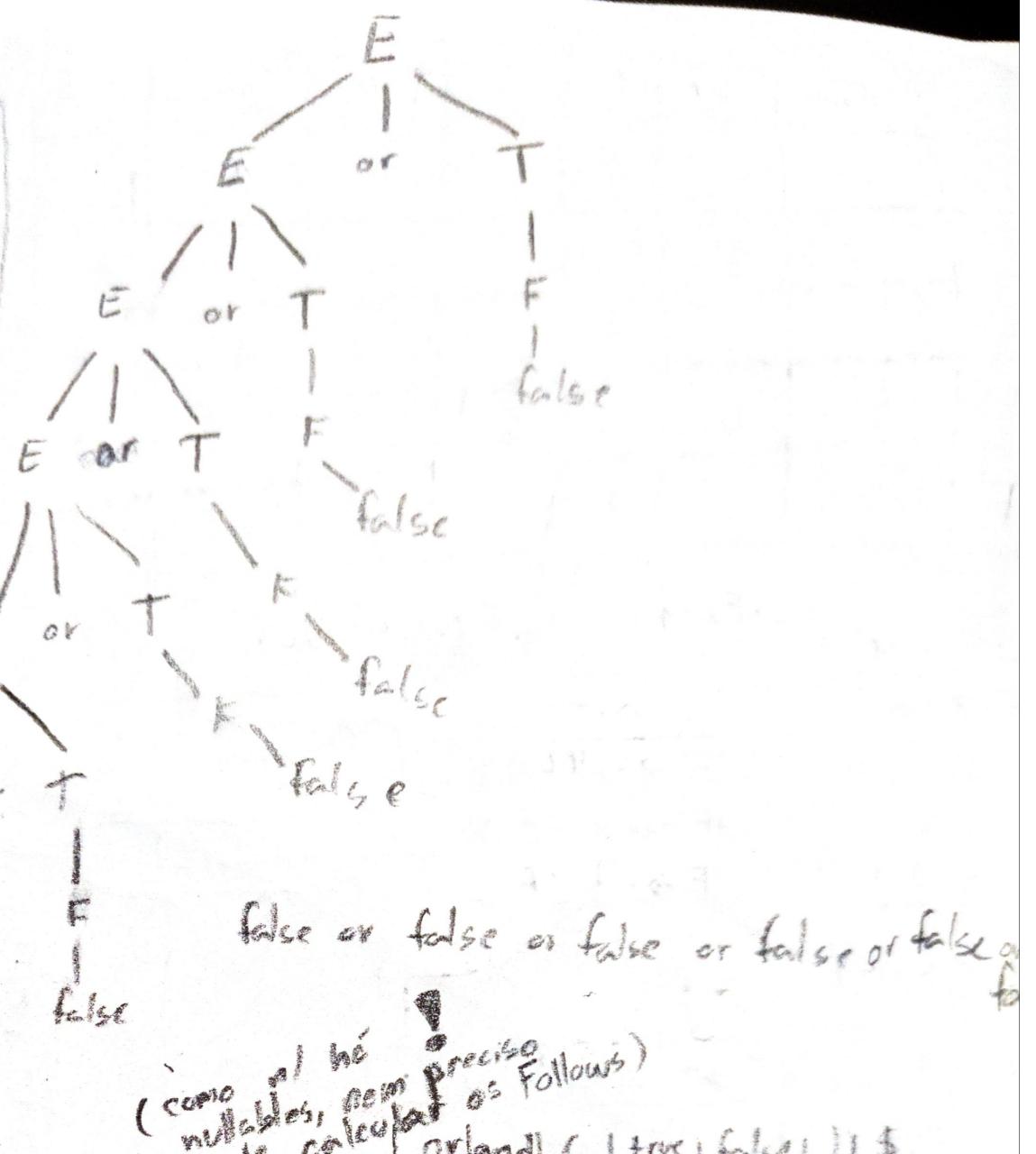
OCTAL  $\rightarrow \xrightarrow{0} \xrightarrow{[0-7]} @P [0-7]$

c)



② a)

- 1-  $E \rightarrow E \text{ or } T$
- 2-  $T \rightarrow T \text{ and } F$
- 3-  $F \rightarrow \text{true}$
- 4-  $F \rightarrow \text{false}$
- 5-  $I(E)$



b)

$$\text{First}(E) = \text{First}(T) = \{$$

$$\text{First}(T) = \text{First}(F)$$

$$\text{First}(F) = \{\text{true}, \text{false}, \{\}\}$$

		or	and	(	)	true	false	\$
E	0	1, 2	1, 2	1, 2	1, 2			
T	1	3, 4	3, 4	3, 4	3, 4			
F	2	5	5	5	5	6		

c)

1-  $E \rightarrow TE'$  Remove left recursion

2-  $E' \rightarrow \text{or } TE'$

3-  $\vdash E$

4-  $T \rightarrow FT'$

5-  $T' \rightarrow \text{and } F$

6-  $T' \vdash E$

7-  $F \rightarrow \text{true}$

8-  $F \rightarrow \text{false}$

9-  $I(G)$

	Nullable	First	Follow
E	0	t, f, (	2, 3
E'	1	or, E	2, 3
T	0	t, f, (	or, )
T'	1	and, E	or, )
F	0	t, f, (	and, or, ), \$

$$\text{First}(F) = \{t, f, (\}$$

$$\text{First}(T') = \{\text{and}, E\}$$

$$\text{First}(T) = \text{First}(F)$$

$$\text{First}(E') = \{\text{or}, E\}$$

$$\text{First}(E) = \{\text{or}, \}, \$\}$$

$$\text{Follow}(E) = \{\text{or}, \}, \$\}$$

$$\text{Follow}(E') = \{\text{or}, \}, \$\}$$

$$\text{Follow}(T) = \text{First}(E') \setminus E \cup \text{Follow}(E')$$

$$\text{Follow}(T') = \text{Follow}(T) = \{\text{or}, \}, \$\}$$

$$\text{Follow}(F) = \text{First}(T') \setminus E \cup \text{Follow}(T') = \{\text{and}, \text{or}, \}, \$\}$$

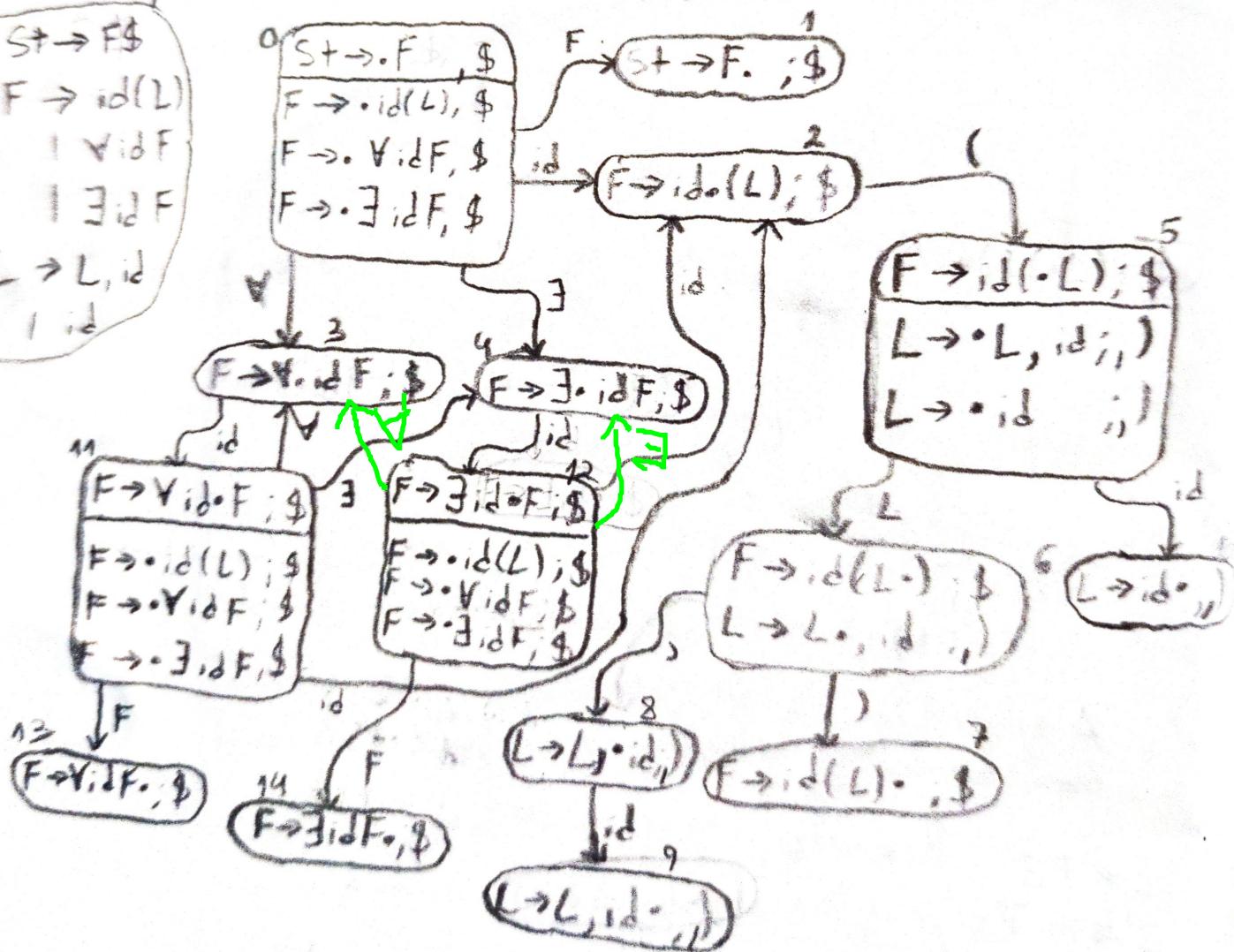
	and	or	(	)	true	false	5
E			1		1	1	
E'		2		3			3
T			4		4	4	
T'	5	6	6				6
F		9		7	8		

A gramática é LLL(1) porque não há conflitos na first-table

③

$$\text{First}(F) = \{ \text{id}, \text{V}, \text{E} \}, \text{First}(L) = \{ \text{id} \}$$

- 1.  $S \rightarrow F \$$
- 2.  $F \rightarrow \text{id}(L)$
- 3.  $\text{id} \rightarrow \text{id}$
- 4.  $\text{id} \rightarrow \text{id} \text{id}$
- 5.  $L \rightarrow L, \text{id}$
- 6.  $\text{id} \rightarrow \text{id}$



	ACTION				L	F
id	(	V	)	,	\$	
0	s2		s3	s4		61
1					ACC	
2		s5				
3	s11					
4	s12					
5	s10				g6	
6		s7		s8		
7					r2	
8	s9					
9		r5		r5		
10		r6		r6		
11	s2		s3	s4		g3
12	s2		s5	s4		g4
13					r3	
14					r4	

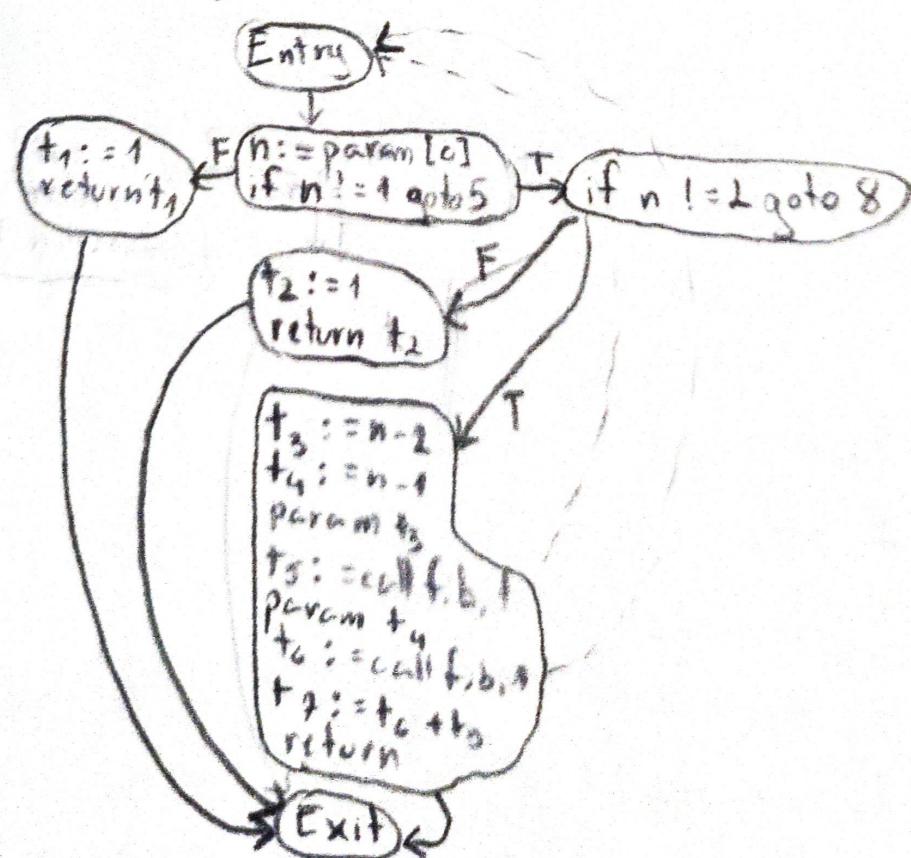
Stack	Current Head	Action
{ }	V id3 id1 id ( id ) \$	s3
{ V }	id3 id1 id ( id ) \$	s11
{ V , id1 }	id3 id ( id ) \$	s9
{ V , id1 , 3 , 4 }	id ( id ) \$	s12
{ V , id1 , 3 , 4 , id2 }	( id ) \$	s2
{ V , id1 , 3 , 4 , id2 }	( id ) \$	s5
{ V , id1 , 3 , 4 , id2 , id3 }	( id ) \$	
{ V , id1 , 3 , 4 , id2 , id3 }	( id ) \$	s10
{ V , id1 , 3 , 4 , id2 , id3 }	( id ) \$	r6
{ V , id1 , 3 , 4 , id2 , id3 }	( id ) \$	s7
{ V , id1 , 3 , 4 , id2 , id3 }	( id ) \$	r2
{ V , id1 , 3 , 4 , id2 , F14 }	( id ) \$	r4
{ V , id1 , F13 }	( id ) \$	r3
{ F13 }	sete	ACC

a) ④ Instrução para chamar a main?

fib:

1 -  $t_1 := \text{param}[0]$   
2 - if  $n \neq 1$  goto 5 ← Também  
3 -  $t_2 := 1$  ← dg para  
4 - return  $t_1$  usar labels  
5 - if  $n \neq 2$  goto 8  
6 -  $t_2 := 1$   
7 - return  $t_2$   
8 -  $t_3 := n - 2$   
9 -  $t_4 := n - 1$   
10 - param  $t_3$   
11 -  $t_5 := \text{call fib}, 1$  ← #arguments  
12 - param  $t_4$   
13 -  $t_6 := \text{call fib}, 1$   
14 -  $t_2 := t_6 + t_5$   
15 - return  $t_2$   
main:  
16 -  $t_8 := 4$   
17 - param  $t_5$   
18 -  $t_9 := \text{call fib}, 1$   
20 - return  $t_9$

b) Leaders = {1, 3, 5, 6, 8}



c) 4

