

## C Teste 2 Finale

$$\textcircled{1} \quad P \rightarrow \epsilon | XItP | XbPzP$$

$$X \rightarrow \epsilon | wC$$

$$I \rightarrow \epsilon | a$$

$$C \rightarrow TIC \cdot T$$

$$T \rightarrow \epsilon | mT$$

a) atwuvwz

Derivando à direita:

$$P \rightarrow XItP \rightarrow XItXbPzP$$

$$\rightarrow XItXbPz\epsilon \rightarrow XItXb\epsilon z$$

$$\rightarrow XIt wC b z \rightarrow XIt wT b z$$

$$\rightarrow XItw mT b z \rightarrow XItwuvwz$$

$$\rightarrow Xatwuvwz \rightarrow Eatwuvwz$$

$$\rightarrow atwuvwz$$

Logo pertence  $\checkmark$

b)  $\{w, t\} \subseteq \text{first}(XItP)$

$$\text{first}(XItP) = \left| \begin{array}{l} \text{first}(x) = \text{first}(\epsilon) \cup \text{first}(wC) = \{ \epsilon, w \} \\ \text{first}(I) = \text{first}(a) \cup \text{first}(t) = \{ \epsilon, a \} \end{array} \right.$$

$$\text{first}(t) = \{ t \}$$

Logo  $\text{first}(XItP) = \{ w, a, t \}$ , logo a afirmação é verdadeira  $\checkmark$

c)  $t \in \text{follow}(T)$

$$\text{follow}(T) = \text{follow}(T) \cup \text{follow}(C) \quad \begin{matrix} \\ (T \rightarrow mI) \end{matrix} \quad \begin{matrix} \\ \{C \rightarrow I / C \rightarrow C \cdot I\} \end{matrix}$$

$$\Rightarrow \text{follow}(C) = \text{follow}(X) \quad \begin{matrix} \\ (X \rightarrow wC) \end{matrix}$$

$$\Rightarrow \text{follow}(X) = \text{first}(I \cdot tP) \setminus \{\epsilon\} \quad \begin{matrix} \\ (P \rightarrow x \cdot tP) \end{matrix}$$
$$\cup \text{first}(\cancel{bPzP}) \setminus \{\epsilon\} \quad \begin{matrix} \\ (P \rightarrow z \cdot bPzP) \end{matrix}$$
$$\hookrightarrow = \{bt\}$$

$$\hookrightarrow \text{follow}(X) = \{a, t, b\}$$

$$\hookrightarrow \text{follow}(C) = \{ab, bt\}$$

$$\hookrightarrow \text{follow}(T) = \{ab, bt\} \text{ logo}$$

a afirmação é verdadeira

d)  $\text{predict}(P \rightarrow X \cdot tP)$

Como  $\text{first}(X \cdot tP)$  não contém  $\epsilon$ , temos

$$\text{Predict}(P \rightarrow X \cdot tP) = \text{first}(X \cdot tP)$$
$$= \{w, a, t\}$$

e) 1<sup>o</sup> violação: C tem recursão à esq.:

$$C \rightarrow T \mid C \circ T$$

$$\downarrow$$
$$C \rightarrow T C'$$
$$C' \rightarrow \circ T C' \mid \varepsilon_1$$

2<sup>o</sup> violação:

"Para  $A \rightarrow \alpha \mid \beta$ ,  $\text{first}(\alpha) \cap \text{first}(\beta) = \emptyset$ "

$$X \text{first}(X \text{ItP}) = \{w, a, t\} \cap \text{first}(x, b, p, z, P) = \{w, b\}$$
$$= \{w\} \neq \emptyset$$

$$P \rightarrow \varepsilon \mid X P'$$

$$P' \rightarrow I t P \mid b P_2 P_2$$

Temos então

$$P \rightarrow \varepsilon \mid X P'$$

$$P' \rightarrow I t P \mid b P_2 P_2$$

$$I \rightarrow \varepsilon \mid a$$

$$C \rightarrow T C'$$

$$C' \rightarrow \circ T C' \mid \varepsilon$$

$$T \rightarrow U \mid m T$$

②

$$T = \{a, b, c, ., (), *, \}\}$$

$* > . > |$        $( ) \rightarrow \text{Override Prioridade}$

$$S \rightarrow C \mid C \cdot T \cdot S$$

$$C \rightarrow F \mid F C$$

$$F \rightarrow V \mid F^*$$

$$V \rightarrow "a" \mid "b" \mid "c" \mid P$$

$$P \rightarrow "c" \cdot S$$

first(ε)

tempos  
(B)

U first

③

a)

	NUM	BOX	Ci	Thicc	Co	{	}	\$	seq item
Z0		Red.	Red.	Red.	Red.	Prod.	Prod.	Prod.	Z1
		seq, ε	seq, ε	seq, ε	seq, ε	seq, ε	seq, ε	seq, ε	
Z1		Shift	Shift	Shift	Shift		Acc		Z2
		Z6	Z5	Z4	Z3				
Z2		Red	Red	Red	Red	Prod	Prod		
		Seq → seq item	seq, ;	seq, ;					
Z3		Shift							
Z4		Shift							
		Z7							
		Z8							

$$\text{follow}(\text{seq}) = \text{first}(\text{item}) \cup \text{first}(\text{;}) \cup \text{follow}(\text{draw})$$

(seq → seq item)      (item → ... seq ; )      (draw → seq)

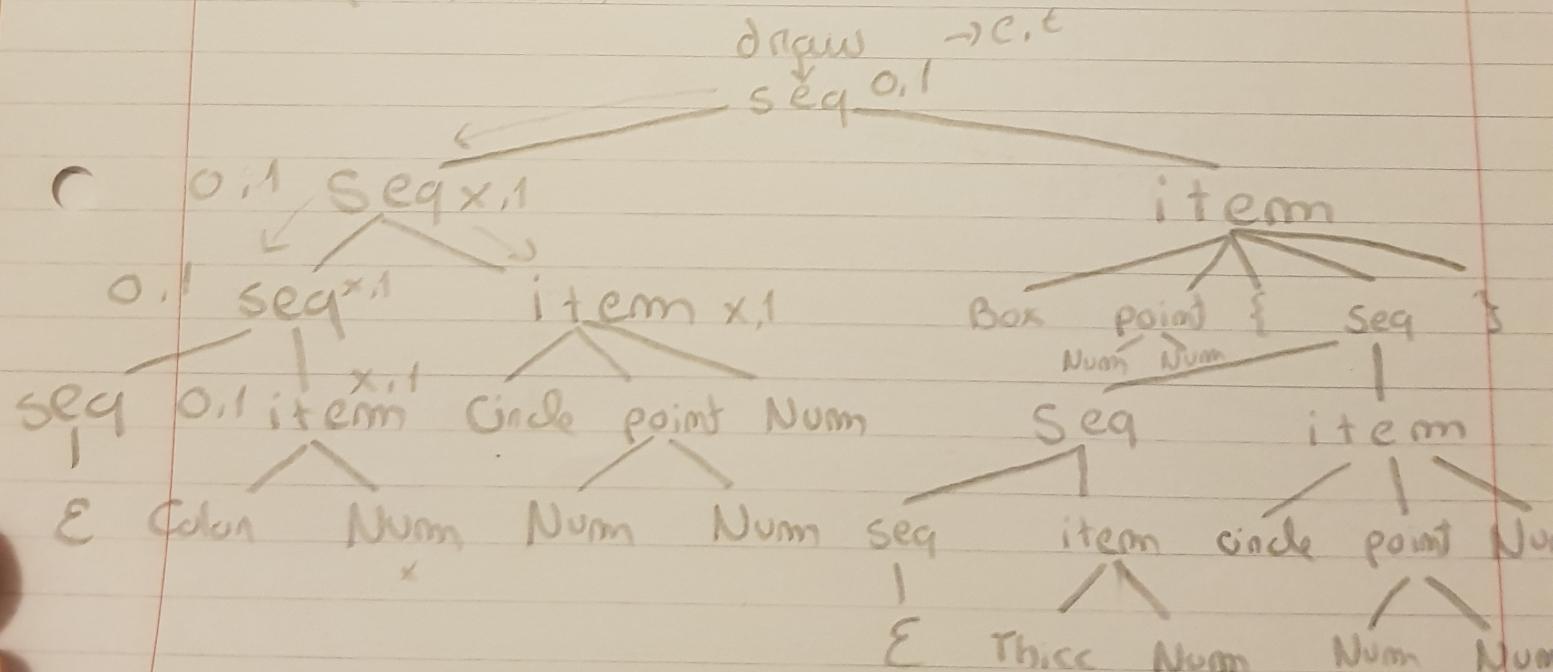
$$= \{\text{colon}, \text{Thicc}, \text{circle}, \text{Box}, \}, \text{EOF}\}$$

$$\text{follow}(\text{item}) = \text{follow}(\text{seq})$$

(seq → seq item) = {colon, Th, ci, ba, }, EOF

b)  $Z_5 = S(z_1, \text{Grade}) = \{ \text{item} \rightarrow G \cdot \text{point\_Num} \}$   
 $\quad \quad \quad \cup \{ \text{point} \rightarrow \cdot \text{Num\_Num} \}$

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**b) Produções**

## Regras Semânticas

draw → seq

Seq. C = 0 ; Seq. t = 1; Seq. x = 0; Seq. y = 0

seq → seq item

Seq<sub>2</sub>.C = Seq<sub>1</sub>.C ; Seq<sub>2</sub>.t = Seq<sub>1</sub>.t  
item.C = Seq<sub>2</sub>.C ; item.t = Seq<sub>2</sub>.t

item → Color Num

item.C = Num.v

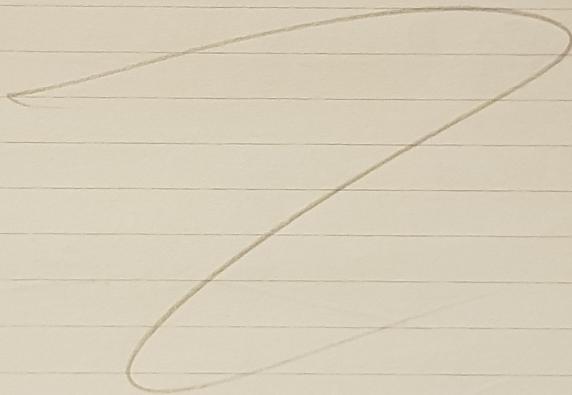
item → Thick Num

item.t = Num.v

Item → Circle pointNum drawCircle (point.x point.y, Num.v, item.c  
item.t)

item → Box Point seq<sub>1</sub> Seq. xC = Point.x; seq.y = Point.y

Point → Num Num | Point.x = Num<sub>1</sub>.v; Point.y = Num<sub>2</sub>.v



~~Wojciech~~