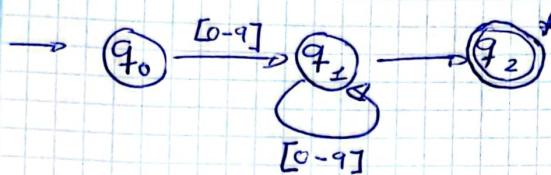


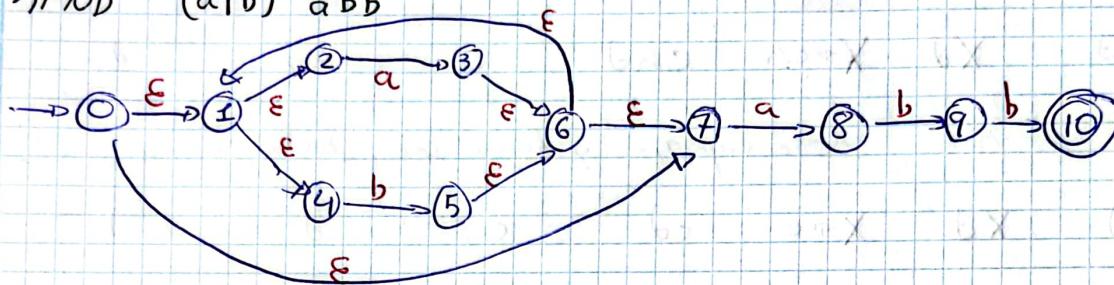
PDL

• Digito + (Diagrama de Transiciones)



Estado	$0-9$	$0f10$	tokon
$q_0$	$q_1$	0mor	
$q_1$	$q_2$	$q_2$	
$q_2$	-	-	Num-entero

• AFND  $(a|b)^*abb$



Estatos del AFND

$\{1, 2, 4, 7\}$

Estatos AFD

A

a

b

$\{3, 8, 6, 7, 1, 2, 4\}$

B

B

D

$\{5, 6, 7, 1, 2, 4\}$

C

B

C

$\{9, 5, 6, 7, 1, 2, 4\}$

D

B

E

$\{10, 5, 1, 2, 4, 6, 7\}$

E

B

C

- Estando en los estados  $\{\}$ , si le añado una 'x' - puedo llegar hasta  $\{\}$  ✓ ahor con  $\epsilon$  hasta donde

$$\text{Mover } (A, a) = \{3, 8\} \Rightarrow \text{completar con } \epsilon \quad \{3, 8, 6, 7, 1, 2, 4\} = B$$

$$\text{Mover } (A, b) :$$

$$\text{Mover } (B, a) :$$

;

## • Analizador sintáctico

- Descendente

• Recursivo

$S \rightarrow A$  Axioma

$V_T \rightarrow$  Símbolos terminales

$V_{NT} \rightarrow$  Símbolos no terminales

$G(S \rightarrow cXd ; X \rightarrow ck | c)$

<u>Entrada</u>	<u>Pila</u>	<u>Regla a aplicar</u>	<u>sobriene en la pila</u>	<u>Emparejado</u>	<u>quedan pilas</u>	<u>quedan Entradas</u>
cd	S	$S \rightarrow cXd$	cXd	c	Xd	cd
cd	Xd	$X \rightarrow ck$	ckd	c	kd	d
d	kd	<i>no se empareja y tengo que deshacer</i>				
cd	Xd	$X \rightarrow c$	cd	c	d	d
d	d			d		

## • Predictivo LL(1)

• Conjuntos de primeros

$$\begin{array}{ll}
 \text{prim} & A \rightarrow aBc \quad \text{prim}(A) = \{a\} \cup \{\text{prim}(B) - \epsilon\} = \{a, x, b\} \\
 & A \rightarrow xC \\
 & A \rightarrow B \quad \text{prim}(B) = \{b\} \\
 & B \rightarrow bA \quad \text{prim}(c) = \{c\} \\
 & C \rightarrow c
 \end{array}$$

$$\begin{array}{ll}
 \text{prim} & E \rightarrow TE' \quad \text{prim}(E) = \text{prim}(T) = \text{prim}(F) = \{(, m\} \\
 & E' \rightarrow +TE' |\epsilon \quad \text{prim}(E') = \{+, \epsilon\} \\
 & T \rightarrow FT' \quad \text{prim}(T') = \{*, \epsilon\} \\
 & T' \rightarrow *FT' |\epsilon \\
 & F \rightarrow (E) | m
 \end{array}$$

### Conjunto siguiente

$$\text{sig}(S) = \{\$, \text{sig}(E)\} = \text{sig}(E) \cup \{\$\} = \{\$, \$\}$$

$$\text{sig}(E') = \text{sig}(E) = \{\$, \$\}$$

$\epsilon'$  nunca aparece a la derecha en E

$$\text{sig}(T) = \text{prim}(E') \cup \text{sig}(E') = \{+, \$, \$\}$$

$$\text{sig}(+) = \text{sig}(+) = \{+, \$, \$\}$$

$$\text{sig}(F) = \text{prim}(+) \cup \text{sig}(T) \cup \text{sig}(+) = \{\$, +, \$, \$\}$$

prim cab

$$S \rightarrow cA \quad \text{prim}(S) = \{c\}$$

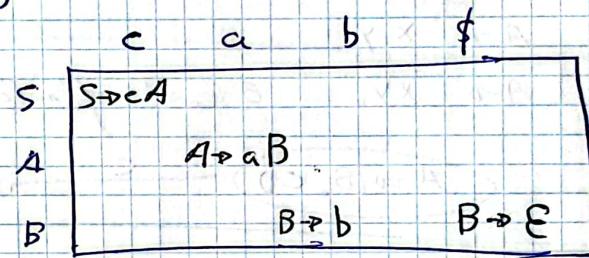
$$A \rightarrow aB \quad \text{prim}(A) = \{a\}$$

$$B \rightarrow b | \epsilon \quad \text{prim}(B) = \{b, \epsilon\}$$

$$\text{sig}(S) = \{\$\}$$

$$\text{sig}(A) = \text{sig}(S) = \{\$\}$$

$$\text{sig}(B) = \text{sig}(S) = \{\$\}$$



1º cada terminal

## • Ascendente

(con retroceso // predictivos)

## - Predictivo

$$S \rightarrow A$$

$$A \rightarrow Aab \mid b$$

entrada : bab

Pila	Entrada	Acción
\$	bab \$	desplazar
\$ b	ab \$	reducir A → b
\$ A	ab \$	desplazar
\$ Aa	b \$	desplazar
\$ Aab	\$	Reducir A → Aab
\$ A	\$	Reducir S → A
\$ S	\$	Éxito

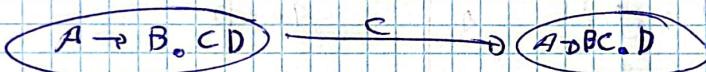
## - LR(0)

ex:

$$A \rightarrow \cdot xy \quad \text{Elementos Encierra}$$

$$A \rightarrow x \cdot y$$

$$A \rightarrow xy \cdot \quad \text{Elementos fijos}$$



$$S \rightarrow (S) S \quad \left. \begin{array}{l} \text{Teneremos los siguientes elementos} \\ S \rightarrow \epsilon \end{array} \right\}$$

$$S \rightarrow \epsilon$$

$$S' \rightarrow \cdot S$$

$$S' \rightarrow S \cdot$$

$$S \rightarrow \cdot (S) S$$

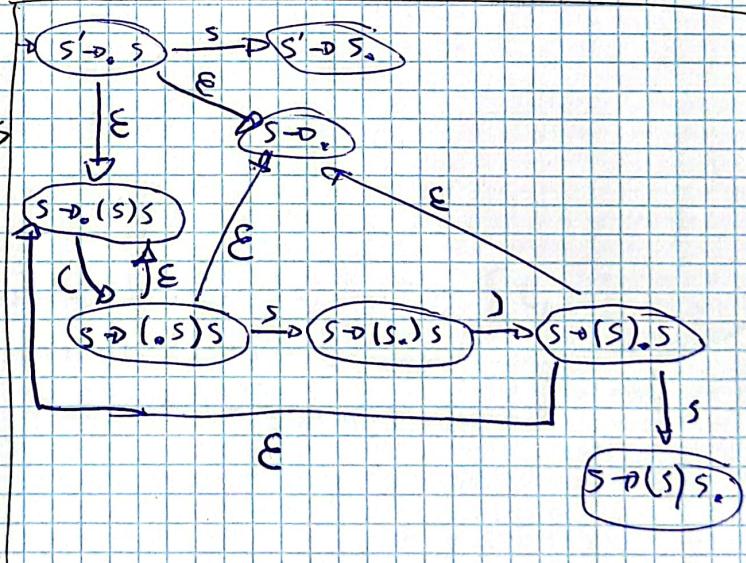
$$S \rightarrow (\cdot S) S$$

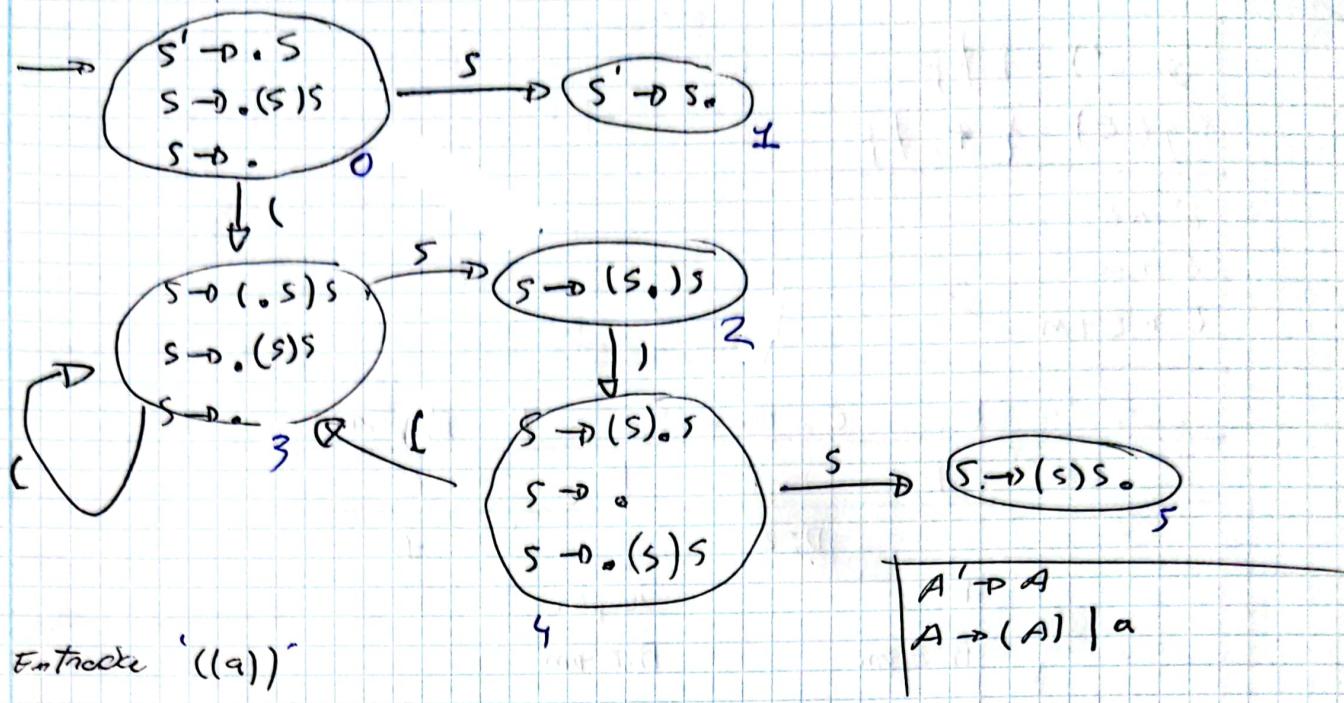
$$S \rightarrow (S \cdot) S$$

$$S \rightarrow (S) \cdot S$$

$$S \rightarrow (\cdot) S$$

$$S \rightarrow \cdot$$





<u>Estado</u>	<u>Acción</u>	<u>Regla</u>	<u>Entrada</u>	<u>Salida</u>
			( a )	A
0	D		3	2
1	R	$A' \rightarrow A$		I
2	R	$A \rightarrow a$		
3	D		3	2
4	D			4
5	R	$A \rightarrow D(A)$		5

## • $SLB(f)$

No es necesario 'acción' y 'regla'  
P de lo anterior parte de la entrada

SLR(1)

$$\text{sig}(E') = \{\$\}$$

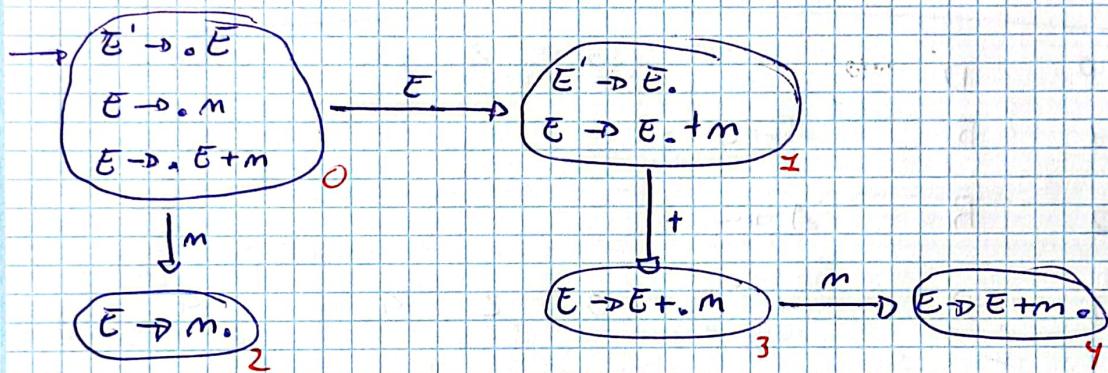
$$\text{sig}(E) = \{+, \$\}$$

$$E' \rightarrow E$$

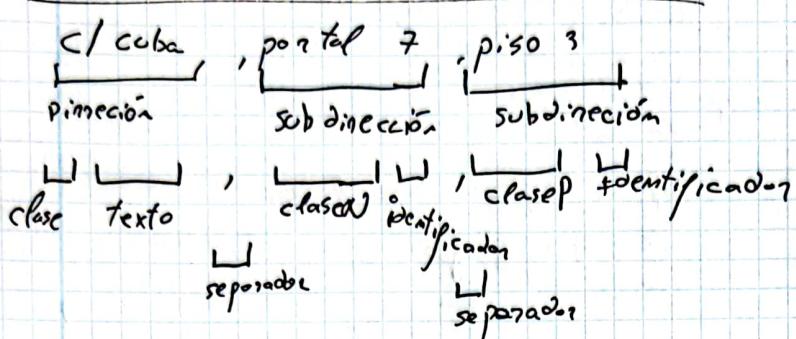
$$E \rightarrow m$$

$$E \rightarrow E + m$$

Estado	Emitidos	IRLA
0	+	E
1	D: 2	Aceptación
2	R: E → m	R: E → m
3	D: 2	
4	R: E → E + m	R: E → E + m



- $(+|-)?[0-9]^+$
- $([A-Z][a-z]^+) \left( \cdot^* [A-Z][a-z]^+ \right)^*$
- $[A-Z][a-z] [A-Z][a-z] \dots [0-9]^*$



clase = [.....]

texto = [a-zA-Z]^+

close = ['c', 'calle', 'Avda', ... ]

-----  
-----  
-----

Texto Dirección = : texto

separador Espacio = ' '+

separador Coma = , ~~,~~

Número = [0-9]^+

clase Portal = ['portal', ... ]

clase Piso = ['piso', ... ]

clase Puerta = ['puerta', ... ]

orden

Texto Dir

Separador

Separador

nun .

$(a|b)? \ b^* c^*$

$$move_1(A, a) = \{4\} \Rightarrow \{4, c\}$$

$$A, b = \{5, 7\} \Rightarrow \{5, 2, 6, 8, 10\}$$

$$A, c = \{2\}$$

$$(B, b) = \{7\} \Rightarrow \{7, 9, 10\}$$

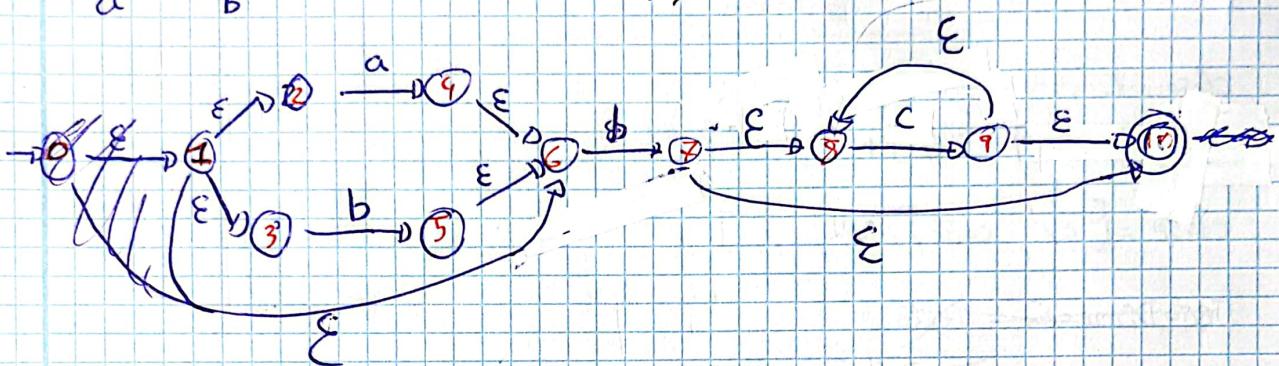
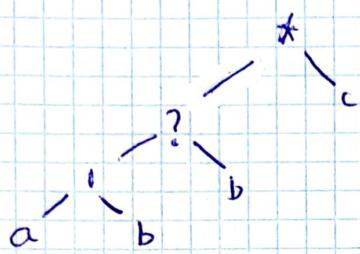
$$(B, c) = \{2\}$$

$$(C, a) =$$

$$(C, b) = \{7\}, + \overline{9, 10} \Rightarrow D$$

$$(C, c) = \{9\}, \Rightarrow \{5, 8, 9, 10\}$$

$D, a$



Estados AFND

$$\{1, 2, 3, 6\}$$

$$\{4, 5, 6\}$$

E.Final \*  $\{5, 7, 6, 8, 10\}$

$$*\{7, 8, 10\}$$

$$*\{8, 9, 10\}$$

Estados AFD

A

B

C

D

E

a

b

c

B

C

D

E

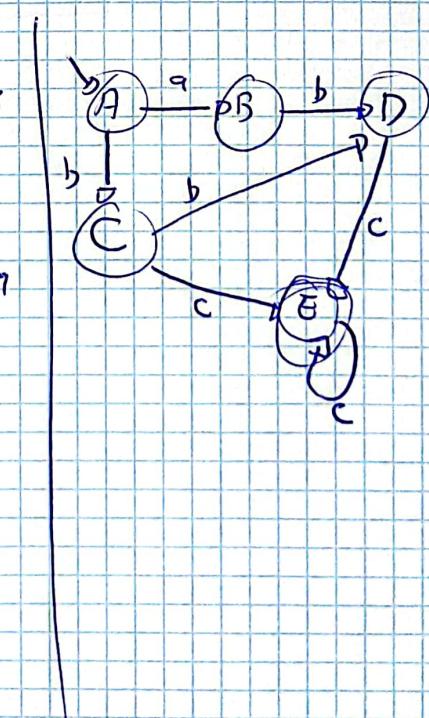
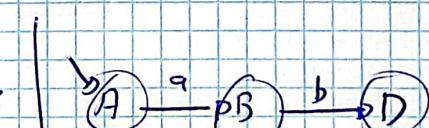
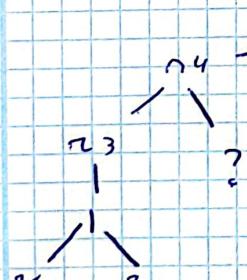
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## 2) Formato XML

Cabecera

Elemento

↳ Elementos

Elemento

↳ Atributo

↳ Nombre

↳ Valor

↳ Atributo

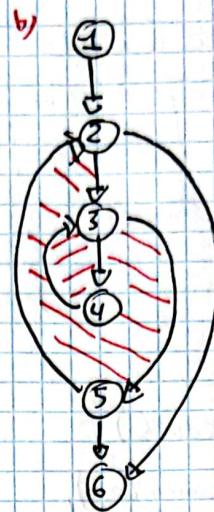
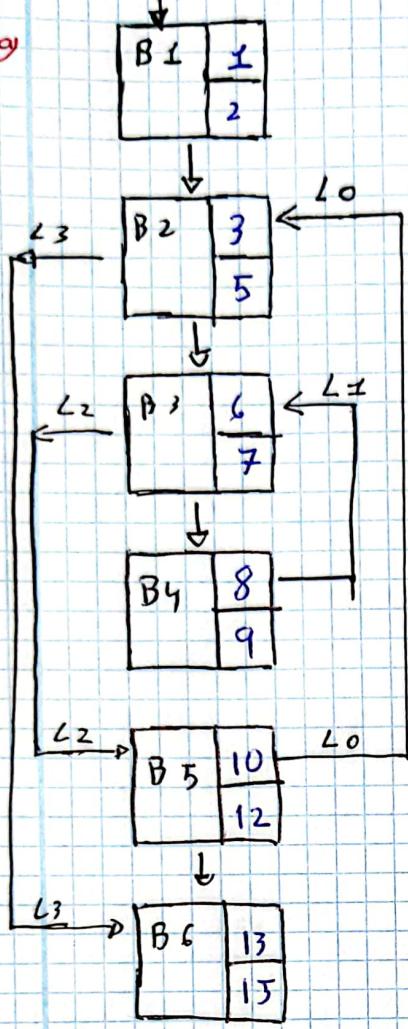
↳ Nombre

↳ Valor

- class FicheroXML {  
    cabecera c = new Cabecera();  
    Elemento eRaiz = new Elemento();  
}
- class Elemento {  
    List < Atributos > attrs;  
    List < Elementos > hijos;  
    String texto; // contenido  
    String etiqueta; // <body>  
}
- class Atributos {  
    String nombre;  
    String valor;  
}

- class cabecera {  
    List < Atributo > attrs;  
}

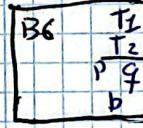
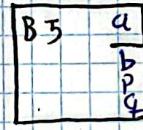
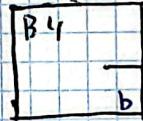
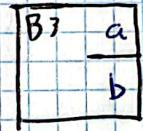
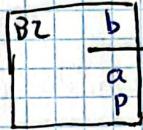
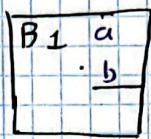
3/g



• 2 bucles anidados

Define  
usa

- con seguridad "b" a partir de B2 está vivo todo el nato.
- El resto no se sabe



$$\underline{a = a + b}$$

$$\rightarrow \frac{(\text{suma}, a, t, q)}{(+, a, t)}$$

$$(\text{asigno}, a, -)$$

$$\underline{\text{if } (b > a) \text{ goto } L_0}$$

$$(C\_PP, b, a)$$

$$(\text{jumpGT}, L_0, -)$$

4) Dada:

$Expr \rightarrow Expr \text{ Op } Expr \mid m \mid p$

$Op \rightarrow \text{Suma} \mid \text{Resta}$

$Vt = m, p, \text{Suma}, \text{Resta}$

$Vnt = Expr, Op$

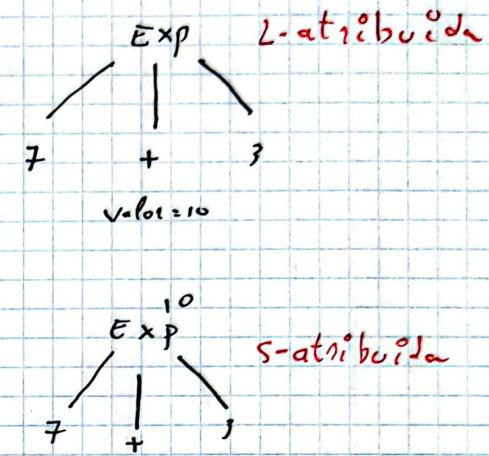
$m \in \text{entero positivo}$

$p \in \text{cadena texto}$

$Expr = Expr \text{ Op } Expr$

$\$1 \quad \$2 \quad \$3 \quad \$4$

	tipo	valor num	valor cod	op
$m$	número	7	X	X
$p$	cadena	X	"paco"	X
suma	operación	X	+	X
Resta	operación	X	-	X
EXP	Evaluar	Evaluar	Evaluar	X
OP	Evaluar	Evaluar	Evaluar	Evaluar



### Reglas semánticas

$\$1, \$2, \$3$   
 $Expr \text{ Op } Expr$

$\text{if } (\$1.\text{tipo} == \text{cadena} \text{ } \vee \vee \text{ } \$1.\text{tipo} == \$2.\text{tipo} \text{ } \vee \vee \text{ } \$3.\text{tipo} == \$1.\text{tipo})$

$\$1.\text{tipo} = \$2.\text{tipo}$

$\$1.\text{ValorC} = \$1.\text{ValorC} + \$3.\text{ValorC}$

$\text{else if } (\$1.\text{tipo} == \$3.\text{tipo} \text{ } \vee \vee \text{ } \$1.\text{tipo} == \text{número})$

$\text{if } (\$2.\text{Valor} == '+')$

$\$1.\text{Valor} = \$1.\text{ValorM} + \$3.\text{ValorM}$

$\text{else}$

$\$1.\text{Valor} = \$1.\text{ValorM} - \$3.\text{ValorM}$

$\text{else if } '+' "$

$\text{throw exception}$

Suma

$\$1.\text{operador} = \$1.\text{op}$

$\text{m } \quad \$1.\text{tipo} = \$1.\text{tipo}$

$\$1.\text{ValorM} = \text{Integer.ParseInt}(\$1.\text{ValorM});$

$\$1.\text{ValorC} = \text{null}$

$\$1.\text{V. OP} = \text{null}$

Igual para todos los  
 $V+$

$$A \rightarrow BC$$

$$B \rightarrow DE$$

$$C \rightarrow \varepsilon \mid zBC$$

$$D \rightarrow yAx \mid v$$

$$E \rightarrow wDE \mid \varepsilon$$

$$\text{Prim}(A) = \{y, v\}$$

$$\therefore (B) = \{\varepsilon, z\}$$

$$\therefore (C) = \{\varepsilon, z\}$$

$$\therefore (D) = \{y, v\}$$

$$\therefore (E) = \{w, \varepsilon\}$$

	y	v	z	w	<del>ϕ</del>	\$
A	$A \rightarrow BC$	$A \rightarrow BC$				
B		$B \rightarrow DE$	$B \rightarrow DE$			
C			$C \rightarrow zBC$			$C \rightarrow \varepsilon$
D	$D \rightarrow yAx$	$D \rightarrow v$				
E				$e \rightarrow wDE$		$E \rightarrow \varepsilon$

$$\text{Sig}(A) = \{x\}$$

$$(B) = \{\varepsilon, z\}$$

$$(C) = \text{Sig}(A) \cup \text{Prim}(C)$$

$$(D) = \{w, \varepsilon\} \cup \text{Prim}(E)$$

$$(E) = \text{Sig}(B) \cup \cancel{\text{Prim}}$$

 $=$ 

$$A \rightarrow BC$$

$$B \rightarrow DE$$

$$C \rightarrow zBC$$

$$C \rightarrow \varepsilon$$

$$D \rightarrow v$$

$$D \rightarrow yAx$$

$$E \rightarrow wDE$$

$$E \rightarrow \varepsilon$$

$$\text{Prim}(A) = \text{Prim}(B) = \text{Prim}(D) = v, y$$

$$(B) = \text{Prim}(D) = v, y$$

$$(C) = z, \varepsilon$$

$$(D) = v, y$$

$$(E) = w, \varepsilon$$

$$\text{Sig}(A) = x$$

$$(B) = \text{prim}(c) = z$$

$$(C) = \text{prim}(A), \infty = x$$

$$(D) = \text{prim}(D) = y, v$$

$$(E) = \text{sig}(B) = z$$

	y	v	z	w	<del>ϕ</del>	x
A	$A \rightarrow BC$	$A \rightarrow BC$				
B		$B \rightarrow DE$	$B \rightarrow DE$		$C \rightarrow zBC$	$\underline{z \rightarrow \varepsilon}$
C						
D	$D \rightarrow yAx$	$D \rightarrow v$				
E				$e \rightarrow wDE$	$E \rightarrow \varepsilon$	

Pongo las reglas de sus Sig.

$$\text{Sig}(A) = x$$

$$(B) = \text{prim}(c) = z$$

$$(C) = \text{prim}(A), \infty = x$$

$$(D) = \text{prim}(D) = y, v$$

$$(E) = \text{sig}(B) = z$$

$$A \rightarrow aCBd$$

$$B \rightarrow \epsilon BfD$$

$$B \rightarrow \epsilon$$

$$C \rightarrow \epsilon$$

$$C \rightarrow m$$

$$D \rightarrow aDD'$$

$$D \rightarrow \epsilon$$

$$D' \rightarrow a$$

$$D' \rightarrow b$$

$$D' \rightarrow f$$

	a	b	d	f	m	\$
A			$A \rightarrow aCBd$			
B				$\cancel{B \rightarrow \epsilon BfD}$ $\cancel{B \rightarrow \epsilon}$	$B \rightarrow \epsilon$	
C					$C \rightarrow \epsilon$	$C \rightarrow m$
D			$D \rightarrow aDD'$			
D'			$D' \rightarrow a$	$D' \rightarrow b$		$D' \rightarrow f$

primeros

$$\begin{aligned} A) &\rightarrow a \\ B) &\rightarrow d (\epsilon) \\ C) &\Rightarrow m, \epsilon \\ D) &\rightarrow a, \epsilon \\ D') &\rightarrow a, b, f \end{aligned}$$

Si S (A)  $\Rightarrow \$$

$$\begin{aligned} B) &\rightarrow d, f \\ C) &\rightarrow \text{prim}(B) = d \end{aligned}$$

$$D) \rightarrow \text{prim}(D') \cup \text{prim}(B) = d a b f$$

$$D') \rightarrow \text{prim}(D) \underline{(abdf)}$$

$$a + (b|c)^* d$$

