#### 1. EXPRESIÓN REGULAR DE CADA TOKEN:

**Identificador** 

**Expresión regular:** [L][L|D]+

L = letra D = dígito

Número entero:

Expresión regular: [0-9]+

Número decimal:

**Expresión regular:** [0-9]+[.][0-9]+

Signos de puntuación:

**Expresión regular:** [.]|[,]|[;]|[:]

**Operador aritmético:** 

**Expresión regular:** [+] | [-] | [\*] | [%]

Signos de agrupación:

**Expresión regular:** [(]|[)]|[{]|[}]|[|]

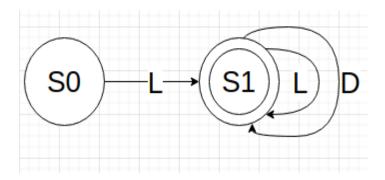
## 2. GRAMÁTICA REGULAR DE CADA TOKEN

**Identificador:** 

**AFD** 

Alfabeto: {a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z}

Expresión regular: [L][L|D]+ Diagrama de transiciones:



Estados: {S0,S1} Estado inicial: S0

Estados de aceptación: {S1}

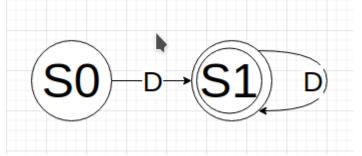
Función de transición:

d(S0,L)=S1 d(S1,L)=S1 d(S1,D)=S1

Número entero:

#### **AFD**

Alfabeto: {0,1,2,3,4,5,6,7,8,9} Expresión regular: [0-9]+ Diagrama de transiciones:



Estados: {S0,S1} Estado inicial: S0

Estados de aceptación: {S1} Función de transición:

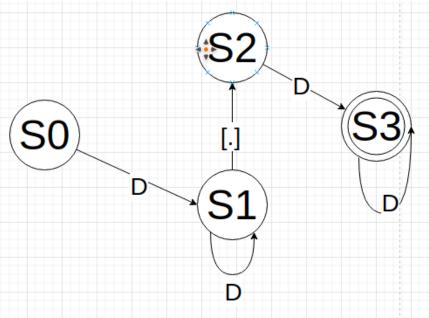
d(S0,D)=S1 d(S1,D)=S1

#### Número decimal:

**AFD** 

Alfabeto: {0,1,2,3,4,5,6,7,8,9, .} Expresión regular: [0-9]+[.][0-9]+

Diagrama de transiciones:



Estados: {S0,S1,S2,S3} Estado inicial: S0

Estados de aceptación: {S3}

Función de transición:

d(S0,D)=S1 d(S1,D)=S1 d(S1,[.])=S2 d(S2,D)=S3 d(S3,D)=S3

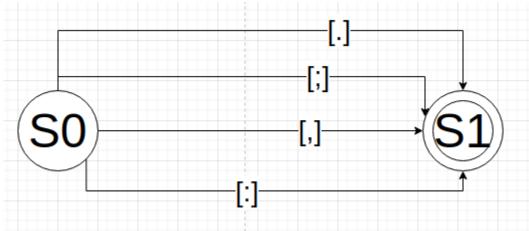
# Signos de puntuación:

### ĀFD

Alfabeto: {, . ; :}

Expresión regular:  $[.] \mid [,] \mid [;] \mid [:]$ 

Diagrama de transiciones:



Estados: {S0,S1} Estado inicial: S0

Estados de aceptación: {S1} Función de transición:

d(S0,[.])=S1 d(S0,[,])=S1 d(S0,[;])=S1 d(S0,[:])=S1

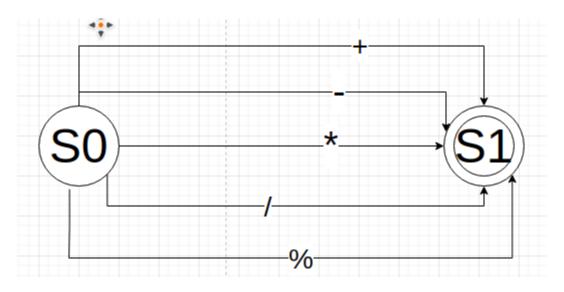
# Signos de operación:

#### **AFD**

Alfabeto: {+ - / \* %}

Expresión regular: [+] | [-] | [\*] | [/] | [%]

Diagrama de transiciones:



Estados: {S0,S1} Estado inicial: S0

Estados de aceptación: {S1} Función de transición:

d(S0,+)=S1 d(S0,-)=S1 d(S0,\*)=S1 d(S0,/)=S1 d(S0,%)=S1

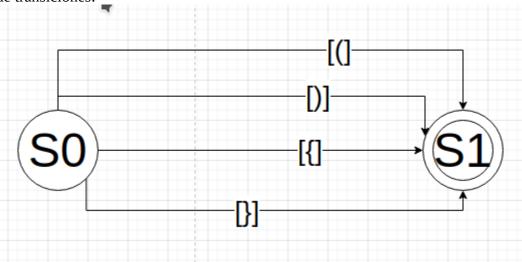
# Signos de agrupación:

**AFD** 

Alfabeto: {(,), {,}, [,]}

Expresión regular: [(] | [)] | [{] | [}] | [ | ]

Diagrama de transiciones:



Estados: {S0,S1} Estado inicial: S0

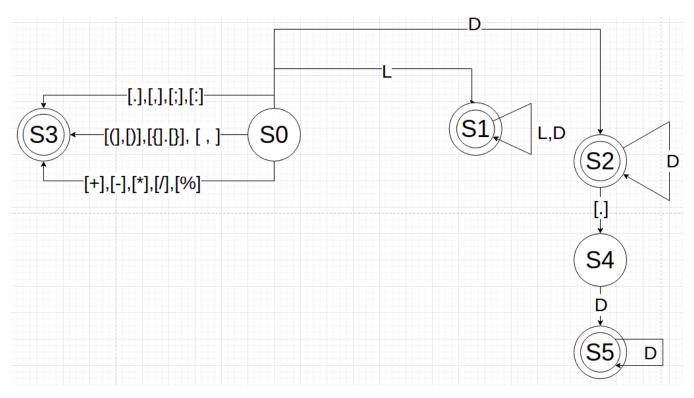
Estados de aceptación: {S1} Función de transición:

d(S0,[(])=S1 d(S0,[(])=S1 d(S0,[{])=S1 d(S0,[{]})=S1

# **AFD** general:

**Expresión regular:**  $[L][L|D]^* \mid [0-9]+ \mid [[0-9]+[.][0-9]+] \mid [[.]|[,]|[;]|[:]] \mid [[+]|[-]|[*]|[/]|[%]] \mid [[(]|[)]|[{]]|[%]]$ 

## a) Diagrama de transiciones:



**Alfabeto:**  $\Sigma$ = {a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, 0,1,2,3,4,5,6,7,8,9,

"(",")","{","}","[","]",+,-,\*,/,%} **Estados**: S0,S1,S2,S3,S4,S5

Estado inicial: S0

Estados de aceptación: S1,S2,S3,S5

#### Función de transición:

d(S0,L)=S1 d(S0,D)=S2 d(S0,[.])= S3

- d(S0,[,]) = S3
- d(S0,[;]) = S3
- d(S0,[:]) = S3
- d(S0,[+])=S3
- d(S0,[-]) = S3
- d(S0,[\*])=S3
- d(S0,[/]) = S3
- d(S0,[%]) = S3
- d(S0,[(])=S3
- d(S0,[(])=S3
- $d(S0,[{]})=S3$
- d(S0,[]) = S3
- d(S0,[)=S3
- d(S0,]) = S3
- d(S1,L)=S1
- d(S1,D)=S1
- d(S2,D)=S2d(S2,[.])=S4
- d(S4,D)=S5
- d(S6,D)=S5

Tabla siguientes: de todo

Nodo	Σ	Siguientes
1	L	2,3,23
2	L	2,3,23
3	D	2,3,23
4	D	4,23
5	D	5,6
6	[.]	7
7	D	7,23
8	[.]	23
9	[,]	23
10	[;]	23
11	[:]	23
12	[+]	23
13	[-]	23
14	[*]	23
15	[/]	23
16	[%]	23

[(]	23
[)]	23
[{]	23
[}]	23
[	23
]	23
\$	
	[(] [{}] [] []

```
S0={1,4,5,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22}
       sig(1)=\{2,3,21\}
                                     S1
                                             d(S0,L)=S1
       sig(4) U sig(5) = \{4,5,6,23\}
                                     S2
                                             d(S0,D)=S2
       sig(8)=\{23\}
                                     S3
                                             d(S0,[.]) = S3
       sig(9)={23}
                                     S3
                                             d(S0,[,]) = S3
                                     S3
       sig(10)=\{23\}
                                             d(S0,[;]) = S3
       sig(11)=\{23\}
                                     S3
                                             d(S0,[:]) = S3
       sig(12)=\{23\}
                                     S3
                                             d(S0,[+]) = S3
                                     S3
                                             d(S0,[-])=S3
       sig(13)=\{23\}
                                             d(S0,[*])=S3
       sig(14)=\{23\}
                                     S3
       sig(15)={23}
                                     S3
                                             d(S0,[/]) = S3
                                     S3
       sig(16)=\{23\}
                                             d(S0,[\%]) = S3
       sig(17) = \{23\}
                                     S3
                                             d(S0,[(])=S3
                                             d(S0,[(])=S3
       sig(18)=\{23\}
                                     S3
       sig(19) = \{23\}
                                     S3
                                             d(S0,[{]})=S3
                                     S3
                                             d(S0,[]) = S3
       sig(20) = \{23\}
       sig(21)=\{23\}
                                     S3
                                             d(S0,[) = S3
       sig(22)=\{23\}
                                     S3
                                             d(S0,]) = S3
S1=\{2,3,21\}
       sig(2)=\{2,3,23\}
                                     S1
                                             d(S1,L)=S1
       sig(3)=\{2,3,23\}
                                     S1
                                             d(S1,D)=S1
S2={4,5,6,21}
       sig(4) U sig(5) = \{4,5,6,21\}
                                     S2
                                             d(S2,D)=S2
       sig(6) = \{7\}
                                     S4
                                             d(S2,[.])=S4
S4={7}
                                     S5
                                             d(S4,D)=S5
       sig(7) = \{7,23\}
S5=\{7,23\}
       sig(7) = \{7,23\}
                                     S7
                                             d(S6,D)=S5
```

## b) Tabla de transiciones:

Q/Σ	L	D	[.]	[,]	[;]	[:]	[+]	[- ]	[*]	[/]	[%]	[(]	[)]	[{]	[}]	[	]
S0	S1	S2	S3	S3	S3	S3	S3	S 3	S3	S3	S3	<b>S</b> 3	S3	S3	S3	<b>S</b> 3	S3
S1	S1	S1															

S2	S2	S4							
S3									
S4	S5								
S5	S5								

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Q/Σ	L	D	[.]	[,]	[;]	[:]	[+]	[-]	[*]	[/]	[%]	[(]	[)]	[{]	[}]	[	]
0	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
2	-1	2	4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
3																	
4	-1	5	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
5	-1	5	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1