



# USAC

## TRICENTENARIA

Universidad de San Carlos de Guatemala

# INGENIERIA

# CUNOC

## Lenguajes Formales y de Programación

### **Práctica1: Trabajo teórico-práctico**

Sección: A

Nombre:

Registro académico:

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202030987

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## 1. Creación de la expresión regular que describa el patrón de cada token.

### 1.1. Identificador:

Expresión regular:  $([L])^+ \cdot ([0-9])^*$

### 1.2. Número:

Expresión regular:  $[0-9]^+$

### 1.3. Decimal:

Expresión regular:  $[0-9]^+ \cdot ([0-9])^*$

### 1.4. Puntuación:

Expresión regular:  $((\cdot) | (,) | (;) | (:))^+$

### 1.5. Operador:

Expresión regular:  $((+) | (-) | (*) | (/) | (%))^+$

### 1.6. Agrupación:

Expresión regular:  $((() | ()) | ([ ] | [ ] ) | ({ } | { } ))^+$

## 2. Gramática regular de cada token.

### 2.1. Identificador:

Definición formal AFD:  $A = (Q, \Sigma, \delta, A, F)$

1.  $Q = \{s_0, s_1\}$

2.  $s_0$

3.  $\Sigma = \{[a-z], [A-Z], [0-9]\}$

4.  $F = \{s_1\}$

5. Función de transición

$\delta(s_0, [L]) = s_1$                        $\delta(s_1, [0-9]) = s_1$

$\delta(s_1, [L]) = s_1$

### 2.2. Número:

Definición formal AFD:  $A = (Q, \Sigma, \delta, A, F)$

1.  $Q = \{s_0, s_1\}$

2.  $s_0$

3.  $\Sigma = \{[0-9]\}$

$$4.F=\{s1\}$$

5. Función de transición

$$\partial(S0, [0-9]) = S1$$

$$\partial(S1, [0-9]) = S1$$

### 2.3. Decimal:

Definición formal AFD:  $A=(Q,\Sigma,\partial,A,F)$

$$1.Q=\{s0, s1,s2,s3\}$$

$$2.s0$$

$$3. \Sigma=\{[0-9],(.)\}$$

$$4.F=\{s3\}$$

5. Función de transición

$$\partial(S0, [0-9]) = S1 \quad \partial(S1, (.)) = S2$$

$$\partial(S1, [0-9]) = S1$$

$$\partial(S2, [0-9]) = S3$$

$$\partial(S3, [0-9]) = S3$$

### 2.4. Puntuación:

Definición formal AFD:  $A=(Q,\Sigma,\partial,A,F)$

$$1.Q=\{s0, s1\}$$

$$2.s0$$

$$3. \Sigma=\{(.), (,), (;), (:)\}$$

$$4.F=\{s1\}$$

5. Función de transición

$$\partial(S0, (.)) = S1 \quad \partial(S0, (,)) = S1 \quad \partial(S0, (;)) = S1 \quad \partial(S0, (:)) = S1$$

$$\partial(S1, (.)) = S1 \quad \partial(S1, (,)) = S1 \quad \partial(S1, (;)) = S1 \quad \partial(S1, (:)) = S1$$

### 2.5. Operador:

Definición formal AFD:  $A=(Q,\Sigma,\partial,A,F)$

1.  $Q=\{s0, s1\}$

2.  $s0$

3.  $\Sigma=\{(+), (-), (*), (/), (\%)\}$

4.  $F=\{s1\}$

5. Función de transición

$\partial(s0, (+)) = s1$     $\partial(s0, (-)) = s1$     $\partial(s0, (*)) = s1$     $\partial(s0, (/)) = s1$     $\partial(s0, (\%)) = s1$

$\partial(s1, (+)) = s1$     $\partial(s1, (-)) = s1$     $\partial(s1, (*)) = s1$     $\partial(s1, (/)) = s1$     $\partial(s1, (\%)) = s1$

## 2.6. Agrupación:

1.  $Q=\{s0, s1\}$

2.  $s0$

3.  $\Sigma=\{(( ), ( )), ( [ ), ( ] ), ( { ), ( ) }\}$

4.  $F=\{s1\}$

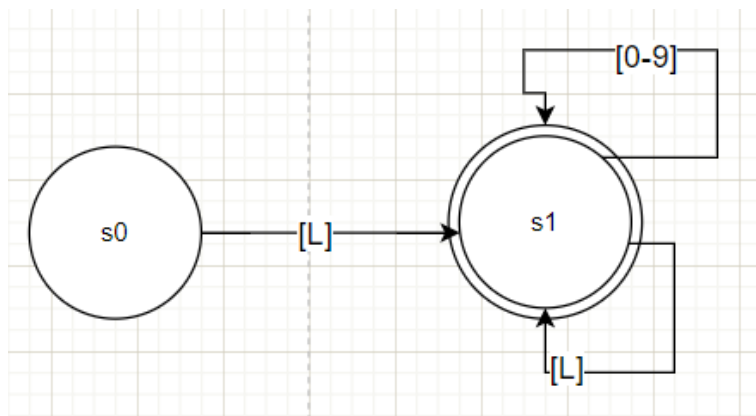
5. Función de transición

$\partial(s0, (( )) = s1$     $\partial(s0, ( )) = s1$     $\partial(s0, ([ )) = s1$     $\partial(s0, (] )) = s1$     $\partial(s0, ({ )) = s1$     $\partial(s0, (} )) = s1$

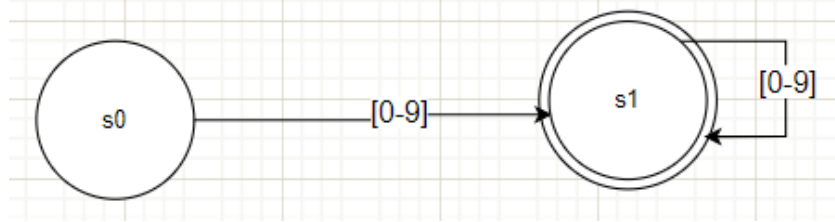
$\partial(s1, (( )) = s1$     $\partial(s1, ( )) = s1$     $\partial(s1, ([ )) = s1$     $\partial(s1, (] )) = s1$     $\partial(s1, ({ )) = s1$     $\partial(s1, (} )) = s1$

## 3. AFD de cada token.

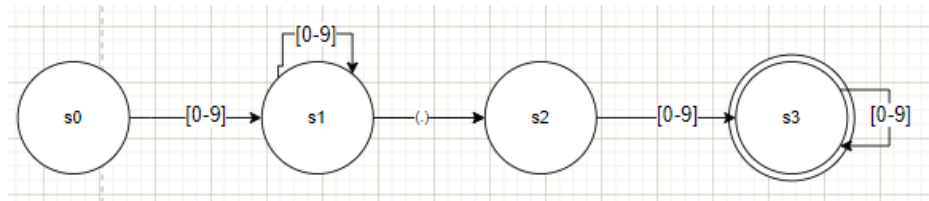
### 3.1. Identificador



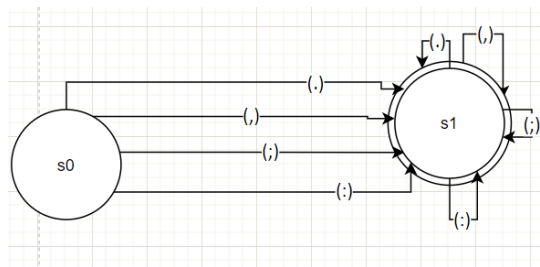
### 3.2.



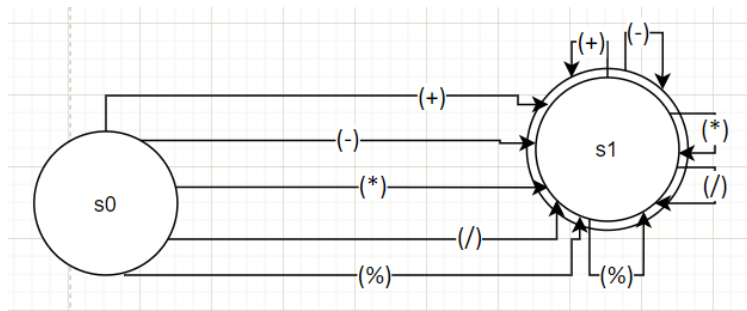
3.3.



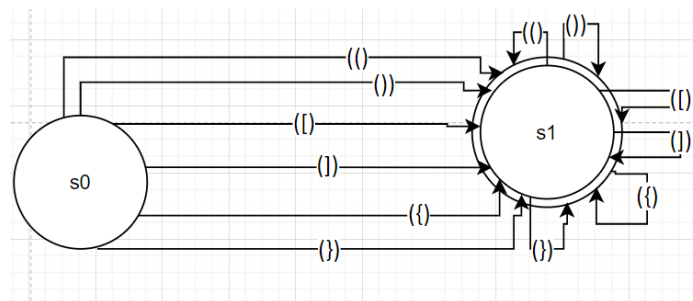
3.4.



3.5.

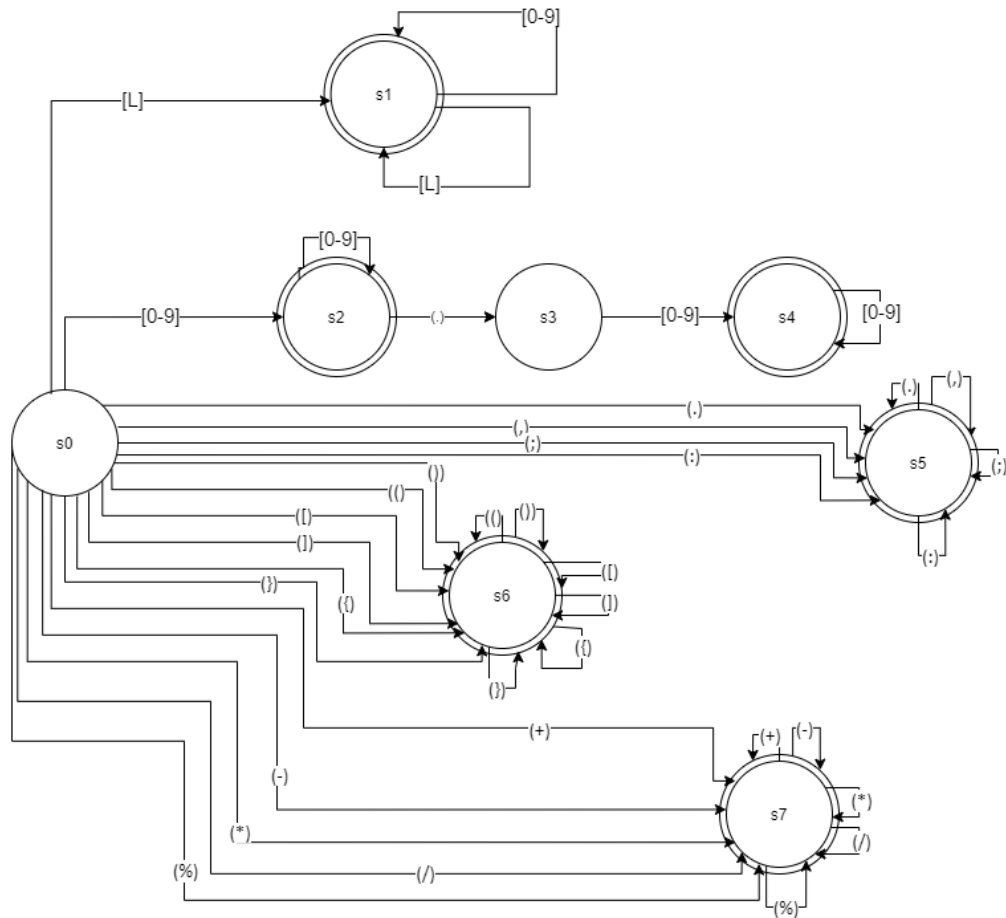


3.6.



#### 4. Creación del AFD que acepte todos los tokens

##### 4.1. Diagrama de transiciones del AFD



##### 4.2. Tabla de transiciones del AFD

FT	s0	s1	s2	s3	s4	s5	s6	s7
L	$\partial(s0, [L])=s1$	$\partial(s1, [L])=s1$						
[0-9]	$\partial(s0, [0-9])=s2$	$\partial(s1, [0-9])=s1$	$\partial(s2, [0-9])=s2$	$\partial(s3, [0-9])=s4$	$\partial(s4, [0-9])=s4$			
(.)	$\partial(s0, (.) )=s5$		$\partial(s2, (.) )=s3$			$\partial(s5, (.) )=s5$		
(,)	$\partial(s0, (,) )=s5$					$\partial(s5, (,) )=s5$		
(:)	$\partial(s0, (:) )=s5$					$\partial(s5, (:) )=s5$		
(:)	$\partial(s0, (:) )=s5$					$\partial(s5, (:) )=s5$		
(+)	$\partial(s0, (+) )=s7$							$\partial(s7, (+) )=s7$
(-)	$\partial(s0, (-) )=s7$							$\partial(s7, (-) )=s7$
(*)	$\partial(s0, (*) )=s7$							$\partial(s7, (*) )=s7$
(/)	$\partial(s0, (/) )=s7$							$\partial(s7, (/) )=s7$

(%)	$\partial(s0, (\%))=s7$							$\partial(s7, (\%))=s7$
(()	$\partial(s0, (() )=s6$						$\partial(s6, (() )=s6$	
())	$\partial(s0, ()) )=s6$						$\partial(s6, ()) )=s6$	
([]	$\partial(s0, ([]))=s6$						$\partial(s6, ([]))=s6$	
([])	$\partial(s0, ([]))=s6$						$\partial(s6, ([]))=s6$	
({})	$\partial(s0, ({}))=s6$						$\partial(s6, ({}))=s6$	
({})	$\partial(s0, ({}))=s6$						$\partial(s6, ({}))=s6$	