

EXPRESIÓN REGULAR

Gramática	Token que devuelve
+	PLUS
-	MINUS
*	MULT
/	DIV
++	INCREMENTAR
--	DECREMENTAR
(OPEN_PARENTHESSES
)	CLOSED_PARENTHESSES
;	END
=	EQUAL
>	MAJOR
<	MINOR
>=	MAJOR_EQUAL
<=	MINOR_EQUAL
==	COMPARATION
!=	DIFFERENT
	OR
&&	AND
!	Negation
SI	SI
SINO	SINO
SINO_SI	SINO_SI
MIENTRAS	MIENTRAS
HACER	HACER
DESDE	DESDE
HASTA	HASTA
INCREMENTO	INCREMENTO
(/./) (a...z A...Z)*	COMENTARIO
(/.*)(a...z A...Z epsilum)* (*. /)	COMENTARIO_EXTERIOR
Entero	INTEGER
Decimal	DOUBLE
Cadena	STRING
Boolean	BOOLEAN
Chart	CHAR

CÁLCULO DE SIGUIENTES

ENTERO

No	E	Siguiente No
1	E	2
2	n	3
3	t	4
4	e	5
5	r	6
6	o	7
7	\$	-

$S_0 = 1$

$\delta(S_0, E) = 2 = S_1$

$\delta(S_1, n) = 3 = S_2$

$\delta(S_2, t) = 4 = S_3$

$\delta(S_3, e) = 5 = S_4$

$\delta(S_4, r) = 6 = S_5$

$\delta(S_5, o) = 7 = S_6$

Definición Formal AFD

1. $Q = S_0, S_1, S_2, S_3, S_4, S_5, S_6$
2. $E = E, n, t, e, r, o$
3. S_0
4. $F = S_6$
5. $\delta(S_0, E) = S_1$
 $\delta(S_1, n) = S_2$
 $\delta(S_2, t) = S_3$
 $\delta(S_3, e) = S_4$
 $\delta(S_4, r) = S_5$
 $\delta(S_5, o) = S_6$

DECIMAL

No	E	Siguiente No
1	D	2
2	e	3
3	c	4
4	i	5
5	m	6
6	a	7
7	l	8
8	\$	-

$S_0=1$

$\delta(S_0, D)=2=S_1$

$\delta(S_1, e)=3=S_2$

$\delta(S_2, c)=4=S_3$

$\delta(S_3, i)=5=S_4$

$\delta(S_4, m)=6=S_5$

$\delta(S_5, a)=7=S_6$

$\delta(S_6, l)=8=S_7$

Definición Formal AFD

1. $Q=S_0, S_1, S_2, S_3, S_4, S_5, S_6, S_7$
2. $E=D, e, c, i, m, a, l$
3. S_0
4. $F=S_7$
5. $\delta(S_0, D)=S_1$
 $\delta(S_1, e)=S_2$
 $\delta(S_2, c)=S_3$
 $\delta(S_3, i)=S_4$
 $\delta(S_4, m)=S_5$
 $\delta(S_5, a)=S_6$
 $\delta(S_6, l)=S_7$

Cadena

No	E	Siguiente No
1	C	2
2	a	3
3	d	4
4	e	5
5	n	6
6	a	7
7	\$	-

$S_0=1$

$\delta(S_0, C)=2=S_1$

$\delta(S_1, a)=3=S_2$

$\delta(S_2, d)=4=S_3$

$\delta(S_3, e)=5=S_4$

$\delta(S_4, n)=6=S_5$

$\delta(S_5, a)=7=S_6$

Definición Formal AFD

1. $Q=S_0, S_1, S_2, S_3, S_4, S_5, S_6$
2. $E=C, a, d, e, n, a$
3. S_0
4. $F=S_6$
5. $\delta(S_0, C)=S_1$
 $\delta(S_1, a)=S_2$
 $\delta(S_2, d)=S_3$
 $\delta(S_3, e)=S_4$
 $\delta(S_4, n)=S_5$
 $\delta(S_5, a)=S_6$

Boolean

No	E	Siguiente No
1	B	2
2	o	3
3	o	4
4	l	5
5	e	6
6	a	7
7	N	8
8	\$	-

$S_0=1$

$\delta(S_0, B)=2=S_1$

$\delta(S_1, o)=3=S_2$

$\delta(S_2, o)=4=S_3$

$\delta(S_3, l)=5=S_4$

$\delta(S_4, e)=6=S_5$

$\delta(S_5, a)=7=S_6$

$\delta(S_6, n)=8=S_7$

Definición Formal AFD

1. $Q=S_0, S_1, S_2, S_3, S_4, S_5, S_6, S_7$
2. $E=C, a, d, e, n, a$
3. S_0
4. $F=S_7$
5. $\delta(S_0, B)=S_1$
 $\delta(S_1, o)=S_2$
 $\delta(S_2, o)=S_3$
 $\delta(S_3, l)=S_4$
 $\delta(S_4, e)=S_5$
 $\delta(S_5, a)=S_6$
 $\delta(S_6, n)=S_7$

Chart

No	E	Siguiente No
1	C	2
2	h	3
3	a	4
4	r	5
5	t	6
6	\$	-

$S_0=1$

$\delta(S_0, C)=2=S_1$

$\delta(S_1, h)=3=S_2$

$\delta(S_2, a)=4=S_3$

$\delta(S_3, r)=5=S_4$

$\delta(S_4, t)=6=S_5$

Definición Formal AFD

1. $Q=S_0, S_1, S_2, S_3, S_4, S_5$
2. $E=C, h, a, r, t$
3. S_0
4. $F=S_5$
5. $\delta(S_0, C)=S_1$
 $\delta(S_1, h)=S_2$
 $\delta(S_2, a)=S_3$
 $\delta(S_3, r)=S_4$
 $\delta(S_4, t)=S_5$

//

No	E	Siguiente No
1	/	2
2	/	3,4,5
3	Minúsculas	3,4,5
4	Mayúsculas	3,4,5
5	\$	-

So=1

$\delta(\text{So}, /) = 2 = S1$

$\delta(\text{S1}, /) = 3,4,5 = S2$

$\delta(\text{S2}, \text{Minúsculas}) = 3,4,5 = S2$

$\delta(\text{S2}, \text{Mayúsculas}) = 3,4,5 = S2$

Definición Formal AFD

1. $Q = \text{So}, S1, S2$
2. $E = /, /, \text{Minúsculas}, \text{Mayúsculas}$
3. So
4. $F = S2$
5. $\delta(\text{So}, /) = S1$
 $\delta(\text{S1}, /) = S2$
 $\delta(\text{S2}, \text{Minúsculas}) = S2$
 $\delta(\text{S2}, \text{Mayúsculas}) = S2$

/**/

No	E	Siguiente No
1	/	2
2	*	3,4,5,6
3	Minúsculas	3,4,5,6
4	Mayúsculas	3,4,5,6
5	epsilum	3,4,5,6
6	*	7
7	/	8
8	\$	-

So=1

$\delta(So, /) = 2 = S1$

$\delta(S1, *) = 3,4,5,6 = S2$

$\delta(S2, \text{Minúsculas}) = S2$

$\delta(S2, \text{Mayúsculas}) = S2$

$\delta(S2, \text{epsilum}) = S2$

$\delta(S2, *) = 7 = S3$

$\delta(S3, /) = 8 = S4$

Definición Formal AFD

1. $Q = S0, S1, S2, S3, S4$
2. $E = /, *, \text{Minúsculas}, \text{Mayúsculas}, \text{epsilum}$
3. $S0$
4. $F = S4$
5. $\delta(S0, /) = S1$
 $\delta(S1, *) = S2$
 $\delta(S2, \text{Minúsculas}) = S2$
 $\delta(S2, \text{Mayúsculas}) = S2$
 $\delta(S2, \text{epsilum}) = S2$
 $\delta(S2, *) = S3$
 $\delta(S3, /) = S4$

SI

No	E	Siguiente No
1	S	2
2	I	3
3	\$	-

$S_0=1$

$\delta(S_0, S)=2=S_1$

$\delta(S_1, I)=3=S_2$

Definición Formal AFD

1. $Q=S_0, S_1, S_2$
2. $E=S, I$
3. S_0
4. $F=S_2$
5. $\delta(S_0, S)=S_1$
 $\delta(S_1, I)=S_2$

SINO

No	E	Siguiente No
1	S	2
2	I	3
3	N	4
4	O	5
5	\$	-

$S_0=1$

$\delta(S_0, S)=2=S_1$

$\delta(S_1, I)=3=S_2$

$\delta(S_2, N)=4=S_3$

$\delta(S_3, O)=5=S_4$

Definición Formal AFD

1. $Q=S_0, S_1, S_2, S_3, S_4$
2. $E=S, I, N, O$
3. S_0
4. $F=S_4$
5. $\delta(S_0, S)=S_1$
 $\delta(S_1, I)=S_2$
 $\delta(S_2, N)=S_3$
 $\delta(S_3, O)=S_4$

SINO_SI

No	E	Siguiente No
1	S	2
2	I	3
3	N	4
4	O	5
5	_	6
6	S	7
7	I	8
8	\$	-

So=1

$\delta(So, S) = 2 = S1$

$\delta(S1, I) = 3 = S2$

$\delta(S2, N) = 4 = S3$

$\delta(S3, O) = 5 = S4$

$\delta(S4, _) = 6 = S5$

$\delta(S5, S) = 7 = S6$

$\delta(S6, I) = 8 = S7$

Definición Formal AFD

1. $Q = So, S1, S2, S3, S4, S5, S6, S7$
2. $E = S, I, N, O$
3. So
4. $F = S7$
5. $\delta(So, S) = S1$
 $\delta(S1, I) = S2$
 $\delta(S2, N) = S3$
 $\delta(S3, O) = S4$
 $\delta(S4, _) = S5$
 $\delta(S5, S) = S6$
 $\delta(S6, I) = S7$

MIENTRAS

No	E	Siguiente No
1	M	2
2	I	3
3	E	4
4	N	5
5	T	6
6	R	7
7	A	8
8	S	9
9	\$	-

$S_0=1$

$\delta(S_0, M)=2=S_1$

$\delta(S_1, I)=3=S_2$

$\delta(S_2, E)=4=S_3$

$\delta(S_3, N)=5=S_4$

$\delta(S_4, T)=6=S_5$

$\delta(S_5, R)=7=S_6$

$\delta(S_6, A)=8=S_7$

$\delta(S_7, S)=9=S_8$

Definición Formal AFD

1. $Q=S_0, S_1, S_2, S_3, S_4, S_5, S_6, S_7, S_8$
2. $E=M, I, E, N, T, R, A, S$
3. S_0
4. $F=S_8$
5. $\delta(S_0, M)=S_1$
 $\delta(S_1, I)=S_2$
 $\delta(S_2, E)=S_3$
 $\delta(S_3, N)=S_4$
 $\delta(S_4, T)=S_5$
 $\delta(S_5, R)=S_6$
 $\delta(S_6, A)=S_7$
 $\delta(S_7, S)=S_8$

HACER

No	E	Siguiente No
1	H	2
2	A	3
3	C	4
4	E	5
5	R	6
6	\$	-

$S_0=1$

$\delta(S_0, H)=2=S_1$

$\delta(S_1, A)=3=S_2$

$\delta(S_2, C)=4=S_3$

$\delta(S_3, E)=5=S_4$

$\delta(S_4, R)=6=S_5$

Definición Formal AFD

1. $Q=S_0, S_1, S_2, S_3, S_4, S_5$
2. $E=H, A, C, E, R$
3. S_0
4. $F=S_5$
5. $\delta(S_0, H)=S_1$
 $\delta(S_1, A)=S_2$
 $\delta(S_2, C)=S_3$
 $\delta(S_3, E)=S_4$
 $\delta(S_4, R)=S_5$

DESDE

No	E	Siguiente No
1	D	2
2	E	3
3	S	4
4	D	5
5	E	6
6	\$	-

$S_0=1$

$\delta(S_0, D)=2=S_1$

$\delta(S_1, E)=3=S_2$

$\delta(S_2, S)=4=S_3$

$\delta(S_3, D)=5=S_4$

$\delta(S_4, E)=6=S_5$

Definición Formal AFD

1. $Q=S_0, S_1, S_2, S_3, S_4, S_5$
2. $E=D, E, S$
3. S_0
4. $F=S_5$
5. $\delta(S_0, D)=S_1$
 $\delta(S_1, E)=S_2$
 $\delta(S_2, S)=S_3$
 $\delta(S_3, D)=S_4$
 $\delta(S_4, E)=S_5$

HASTA

No	E	Siguiente No
1	H	2
2	A	3
3	S	4
4	T	5
5	A	6
6	\$	-

$S_0=1$

$\delta(S_0, H)=2=S_1$

$\delta(S_1, A)=3=S_2$

$\delta(S_2, S)=4=S_3$

$\delta(S_3, T)=5=S_4$

$\delta(S_4, A)=6=S_5$

Definición Formal AFD

1. $Q=S_0, S_1, S_2, S_3, S_4, S_5$
2. $E=H, A, S, T$
3. S_0
4. $F=S_5$
5. $\delta(S_0, H)=S_1$
 $\delta(S_1, A)=S_2$
 $\delta(S_2, S)=S_3$
 $\delta(S_3, T)=S_4$
 $\delta(S_4, A)=S_5$

INCREMENTO

No	E	Siguiente No
1	I	2
2	N	3
3	C	4
4	R	5
5	E	6
6	M	7
7	E	8
8	N	9
9	T	10
10	O	11
11	\$	-

$S_0=1$

$\delta(S_0, I)=2=S_1$

$\delta(S_1, N)=3=S_2$

$\delta(S_2, C)=4=S_3$

$\delta(S_3, R)=5=S_4$

$\delta(S_4, E)=6=S_5$

$\delta(S_5, M)=7=S_6$

$\delta(S_6, E)=8=S_7$

$\delta(S_7, N)=9=S_8$

$\delta(S_8, T)=10=S_9$

$\delta(S_9, O)=11=S_{10}$

Definición Formal AFD

1. $Q=S_0, S_1, S_2, S_3, S_4, S_5, S_6, S_7, S_8, S_9, S_{10}$
2. $E=I, N, C, R, E, M, T, O$
3. S_0
4. $F=S_{10}$
5. $\delta(S_0, I)=S_1$
 $\delta(S_1, N)=S_2$
 $\delta(S_2, C)=S_3$
 $\delta(S_3, R)=S_4$
 $\delta(S_4, E)=S_5$
 $\delta(S_5, M)=S_6$
 $\delta(S_6, E)=S_7$
 $\delta(S_7, N)=S_8$
 $\delta(S_8, T)=S_9$
 $\delta(S_9, O)=S_{10}$

+

No	E	Siguiente No
1	+	2
2	\$	-

$S_0=1$

$\delta(S_0,+)=2=S_1$

Definición Formal AFD

1. $Q=S_0, S_1$
2. $E=+$
3. S_0
4. $F=S_1$
5. $\delta(S_0,+)=S_1$

-

No	E	Siguiente No
1	-	2
2	\$	-

$S_0=1$

$\delta(S_0,-)=2=S_1$

Definición Formal AFD

1. $Q=S_0, S_1$
2. $E=-$
3. S_0
4. $F=S_1$
5. $\delta(S_0,-)=S_1$

*

No	E	Siguiente No
1	*	2
2	\$	-

$S_0=1$

$\delta(S_0, *) = 2 = S_1$

Definición Formal AFD

1. $Q = S_0, S_1$
2. $E = *$
3. S_0
4. $F = S_1$
5. $\delta(S_0, *) = S_1$

/

No	E	Siguiente No
1	/	2
2	\$	-

$S_0=1$

$\delta(S_0, /) = 2 = S_1$

Definición Formal AFD

1. $Q = S_0, S_1$
2. $E = /$
3. S_0
4. $F = S_1$
5. $\delta(S_0, /) = S_1$

++

No	E	Siguiente No
1	+	2
2	+	3
3	\$	-

$S_0=1$

$\delta(S_0, +)=2=S_1$

$\delta(S_1, +)=3=S_2$

Definición Formal AFD

1. $Q=S_0, S_1, S_2$
2. $E=+$
3. S_0
4. $F=S_2$
5. $\delta(S_0, +)=S_1$
6. $\delta(S_1, +)=S_2$

--

No	E	Siguiente No
1	-	2
2	-	3
3	\$	-

$S_0=1$

$\delta(S_0, -)=2=S_1$

$\delta(S_1, -)=3=S_2$

Definición Formal AFD

1. $Q=S_0, S_1, S_2$
2. $E=-$
3. S_0
4. $F=S_2$
5. $\delta(S_0, -)=S_1$
6. $\delta(S_1, -)=S_2$

(

No	E	Siguiente No
1	(2
2	\$	-

So=1

$\delta(\text{So}, () = 2 = S1$

Definición Formal AFD

1. $Q = \text{So}, S1$
2. $E = ($
3. So
4. $F = S1$
5. $\delta(\text{So}, () = S1$

)

No	E	Siguiente No
1)	2
2	\$	-

So=1

$\delta(\text{So},) = 2 = S1$

Definición Formal AFD

1. $Q = \text{So}, S1$
2. $E =)$
3. So
4. $F = S1$
5. $\delta(\text{So},) = S1$

;

No	E	Siguiente No
1	;	2
2	\$	-

So=1

$\delta(\text{So},;) = 2 = S1$

Definición Formal AFD

1. $Q = \text{So}, S1$
2. $E = ;$
3. So
4. $F = S1$
5. $\delta(\text{So},;) = S1$

=

No	E	Siguiente No
1	=	2
2	\$	-

So=1

$\delta(\text{So},=) = 2 = S1$

Definición Formal AFD

1. $Q = \text{So}, S1$
2. $E = =$
3. So
4. $F = S1$
5. $\delta(\text{So},=) = S1$

>

No	E	Siguiente No
1	>	2
2	\$	-

$S_0=1$

$\delta(S_0, >) = 2 = S_1$

Definición Formal AFD

1. $Q = S_0, S_1$
2. $E = >$
3. S_0
4. $F = S_1$
5. $\delta(S_0, >) = S_1$

<

No	E	Siguiente No
1	<	2
2	\$	-

$S_0=1$

$\delta(S_0, <) = 2 = S_1$

Definición Formal AFD

1. $Q = S_0, S_1$
2. $E = <$
3. S_0
4. $F = S_1$
5. $\delta(S_0, <) = S_1$

>=

No	E	Siguiente No
1	>	2
2	=	3
3	\$	-

So=1

$\delta(So, >) = 2 = S1$

$\delta(S1, =) = 3 = S2$

Definición Formal AFD

1. $Q = So, S1, S2$
2. $E = >, =$
3. So
4. $F = S2$
5. $\delta(So, >) = S1$
 $\delta(S1, =) = S2$

<=

No	E	Siguiente No
1	<	2
2	=	3
3	\$	-

So=1

$\delta(So, <) = 2 = S1$

$\delta(S1, =) = 3 = S2$

Definición Formal AFD

1. $Q = So, S1, S2$
2. $E = <, =$
3. So
4. $F = S2$
5. $\delta(So, <) = S1$
 $\delta(S1, =) = S2$

==

No	E	Siguiente No
1	=	2
2	=	3
3	\$	-

$So=1$

$\delta(So,=)=2=S1$

$\delta(S1,=)=3=S2$

Definición Formal AFD

1. $Q=So, S1, S2$
2. $E==$
3. So
4. $F=S2$
5. $\delta(So,=)=S1$
 $\delta(S1,=)=S2$

!=

No	E	Siguiente No
1	!	2
2	=	3
3	\$	-

$So=1$

$\delta(So,!)=2=S1$

$\delta(S1,=)=3=S2$

Definición Formal AFD

1. $Q=So, S1, S2$
2. $E=!, =$
3. So
4. $F=S2$
5. $\delta(So,!)=S1$
 $\delta(S1,=)=S2$

||

No	E	Siguiente No
1		2
2		3
3	\$	-

So=1

$\delta(So, |) = 2 = S1$

$\delta(S1, |) = 3 = S2$

Definición Formal AFD

1. $Q = So, S1, S2$
2. $E = |$
3. So
4. $F = S2$
5. $\delta(So, |) = S1$
 $\delta(S1, |) = S2$

&&

No	E	Siguiente No
1	&	2
2	&	3
3	\$	-

So=1

$\delta(So, \&) = 2 = S1$

$\delta(S1, \&) = 3 = S2$

Definición Formal AFD

1. $Q = So, S1, S2$
2. $E = \&$
3. So
4. $F = S2$
5. $\delta(So, \&) = S1$
 $\delta(S1, \&) = S2$

!

No	E	Siguiente No
1	!	2
2	\$	-

$S_0=1$

$\delta(S_0,!) = 2 = S_1$

Definición Formal AFD

1. $Q = S_0, S_1$
2. $E = !$
3. S_0
4. $F = S_1$
5. $\delta(S_0,!) = S_1$