



Universidad Tecnológica Centroamericana

CLASE CURSADA:

Teoría de la Computación

CATEDRATICO:

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PRESENTADO POR:

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CAMPUS

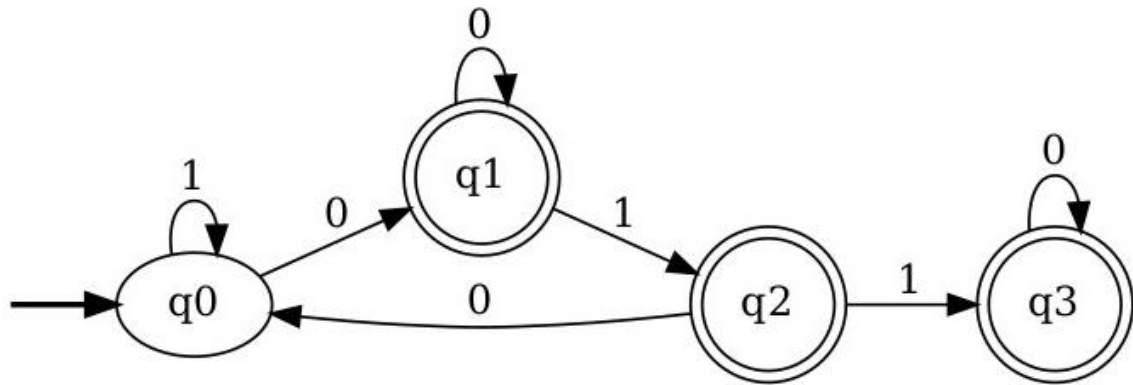
SAN PEDRO SULA, CORTES, HONDURAS

02 DE SEPTIEMBRE DEL 2020

Ejercicio 1

Ingresar un autómata para el siguiente lenguaje: $\{w \mid w \text{ no contiene la subcadena "010"}\}$

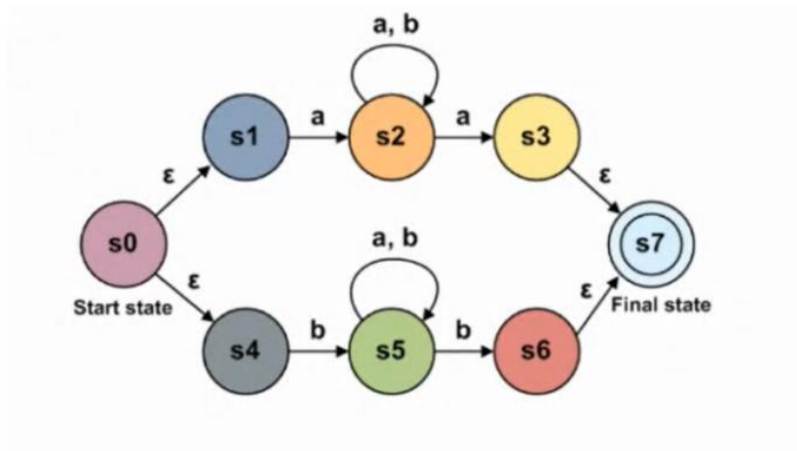
```
----Ingrese Automata----  
Please enter a alphabet: 0  
Please enter a alphabet: 1  
Please enter a alphabet: -1  
  
Please enter final state: q1  
Please enter final state: q2  
Please enter final state: q3  
Please enter final state: -1  
  
Transitions  
from: q0  
Symbol: 1  
to: q0  
  
Transitions  
from: q0  
Symbol: 0  
to: q1  
  
Transitions  
from: q1  
Symbol: 0  
to: q1  
  
Transitions  
from: q1  
Symbol: 1  
to: q2  
  
Transitions  
from: q2  
Symbol: 1  
to: q3  
  
Transitions  
from: q2  
Symbol: 0  
to: q0  
  
Transitions  
from: q3  
Symbol: 0  
to: q3
```



```
{
  "alphabet": ["0", "1"],
  "states": ["q0", "q1", "q2", "q3"],
  "initial_state": "q0",
  "accepting_states": ["q3", "q2", "q1"],
  "transitions": [
    ["q0", "1", "q0"],
    ["q0", "0", "q1"],
    ["q1", "0", "q1"],
    ["q1", "1", "q2"],
    ["q2", "0", "q0"],
    ["q2", "1", "q3"],
    ["q3", "0", "q3"]
  ]
}
```

Regex	Resultado
10011	<pre> EVALUATE JSON --> q0 1 q0 --> q0 0 q1 --> q1 0 q1 --> q1 1 q2 --> q2 1 q3 The expression is part of the automata lenguaje </pre>
0000000	<pre> EVALUATE JSON --> q0 0 q1 --> q1 0 q1 --> q1 0 q1 --> q1 0 q1 --> q1 0 q1 --> q1 0 q1 --> q1 0 q1 --> q1 0 q1 The expression is part of the automata lenguaje </pre>
00001	<pre> EVALUATE JSON --> q0 0 q1 --> q1 0 q1 --> q1 0 q1 --> q1 0 q1 --> q1 1 q2 The expression is part of the automata lenguaje </pre>
00010110011	<pre> EVALUATE JSON --> q0 0 q1 --> q1 0 q1 --> q1 0 q1 --> q1 1 q2 --> q2 0 q0 --> q0 1 q0 --> q0 1 q0 --> q0 0 q1 --> q1 0 q1 --> q1 1 q2 --> q2 1 q3 The expression is part of the automata lenguaje </pre>
111111	<pre> EVALUATE JSON --> q0 1 q0 --> q0 1 q0 --> q0 1 q0 --> q0 1 q0 --> q0 1 q0 --> q0 1 q0 The expression is not part of the automata lenguaje </pre>

Ejercicio 2

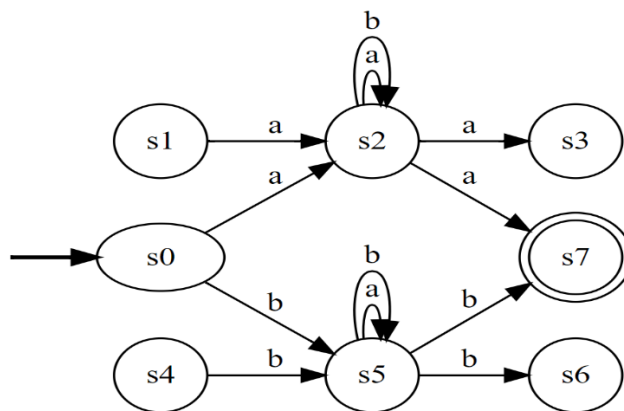


```

{
  "alphabet": ["a", "b", "\u0019"],
  "states": ["s0", "s1", "s2", "s3", "s4", "s5", "s6", "s7"],
  "initial_state": "s0",
  "accepting_states": ["s7"],
  "transitions": [
    ["s0", "\u0019", "s1"],
    ["s1", "a", "s2"],
    ["s2", "a", "s2"],
    ["s2", "b", "s2"],
    ["s2", "a", "s3"],
    ["s3", "\u0019", "s7"],
    ["s0", "\u0019", "s4"],
    ["s4", "b", "s5"],
    ["s5", "a", "s5"],
    ["s5", "b", "s5"],
    ["s5", "b", "s6"],
    ["s6", "\u0019", "s7"]
  ]
}

```

Formato JSON Epsilon



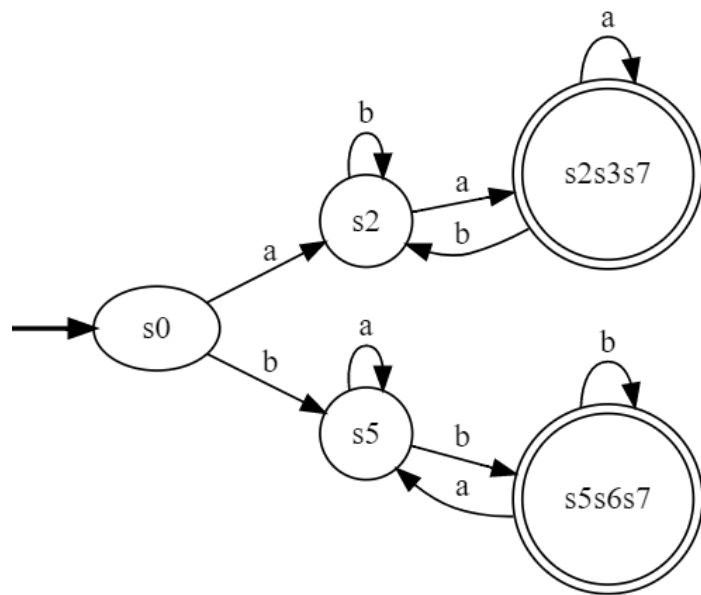
Respuesta Grafica NFA

```

{"alphabet": ["a", "b"],
 "states": ["s0", "s1", "s2", "s3", "s4", "s5", "s6", "s7"],
 "initial_state": "s0",
 "accepting_states": ["s7"],
 "transitions":
[[["s0", "a", "s2"],
 ["s1", "a", "s2"],
 ["s2", "a", "s2"],
 ["s2", "a", "s3"],
 ["s2", "a", "s7"],
 ["s5", "a", "s5"],
 ["s0", "b", "s5"],
 ["s2", "b", "s2"],
 ["s4", "b", "s5"],
 ["s5", "b", "s5"],
 ["s5", "b", "s6"],
 ["s5", "b", "s7"]]]
}

```

Formato JSON



Respuesta Grafica DFA

Regex	Resultado	Tiempo (segundos)
abbaaaa	<pre> EVALUATE JSON --> s0 a s2 --> s2 b s2 --> s2 b s2 --> s2 a s2s3s7 --> s2s3s7 a s2s3s7 --> s2s3s7 a s2s3s7 --> s2s3s7 a s2s3s7 La expresion es parte del automata </pre>	0.369
ab	<pre> EVALUATE JSON --> s0 a s2 --> s2 b s2 La expresion no es parte del lenguaje del automata. </pre>	0.367
baaaaaaaaa	<pre> EVALUATE JSON --> s0 b s5 --> s5 a s5 --> s5 a s5 --> s5 a s5 --> s5 a s5 --> s5 a s5 --> s5 a s5 --> s5 a s5 --> s5 a s5 --> s5 a s5 --> s5 a s5 La expresion no es parte del lenguaje del automata. </pre>	0.351
bbb	<pre> EVALUATE JSON --> s0 b s5 --> s5 b s5s6s7 --> s5s6s7 b s5s6s7 La expresion es parte del automata </pre>	0.341

babbbba

EVALUATE JSON

--> s0 b s5

--> s5 a s5

--> s5 b s5s6s7

--> s5s6s7 b s5s6s7

--> s5s6s7 b s5s6s7

--> s5s6s7 b s5s6s7

--> s5s6s7 b s5s6s7

--> s5s6s7 a s5

La expresion no es parte del lenguaje del automata.

0.369

Ejercicio 2.1

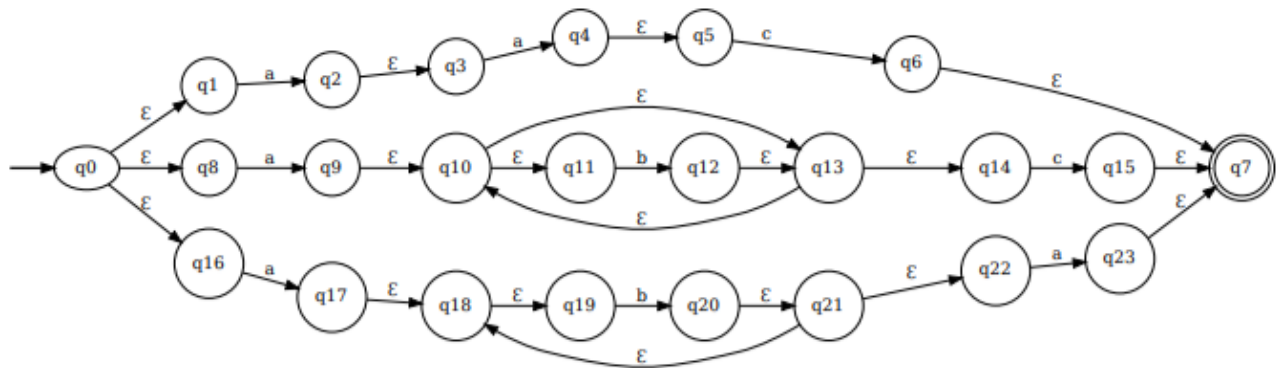
$aac \mid ab^*c \mid aa \mid ab+a$

```
{
  "alphabet": ["a", "c", "b", "\u0019"],
  "states": [
    "q0",
    "q1",
    "q2",
    "q3",
    "q4",
    "q5",
    "q6",
    "q7",
    "q8",
    "q9",
    "q10",
    "q13",
    "q11",
    "q12",
    "q14",
    "q15",
    "q16",
    "q17",
    "q18",
    "q19",
    "q20",
    "q21",
    "q22",
    "q23"
  ],
  "initial_state": "q0",
  "accepting_states": ["q7"],
  "transitions": [
    ["q0", "\u0019", "q1"],
    ["q1", "a", "q2"],
    ["q2", "\u0019", "q3"],
    ["q3", "a", "q4"],
    ["q4", "\u0019", "q5"],
    ["q5", "c", "q6"],
    ["q6", "\u0019", "q7"],
    ["q0", "\u0019", "q8"],
    ["q8", "a", "q9"],
    ["q9", "\u0019", "q10"],
    ["q10", "\u0019", "q13"],
```

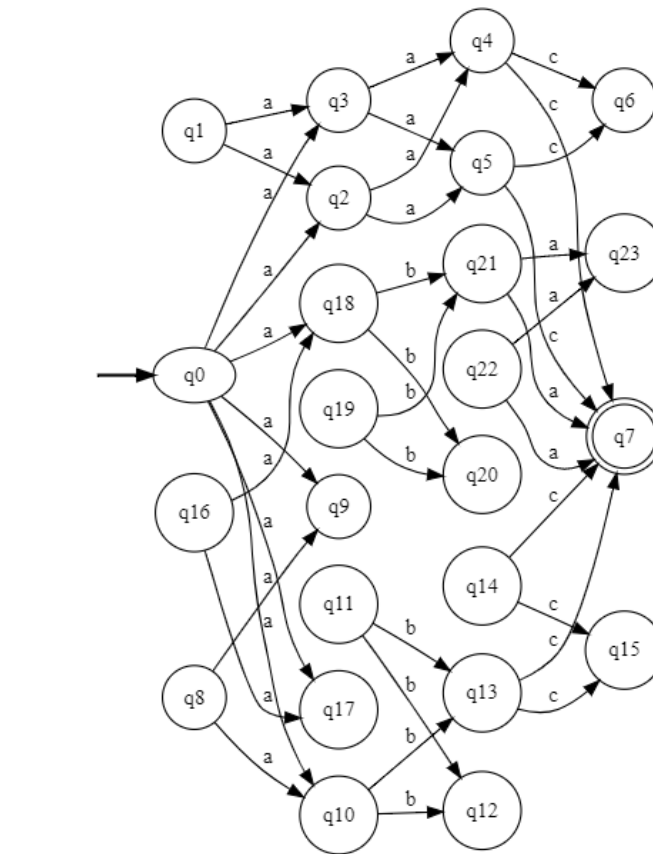
```

["q10", "\u0019", "q11"],
["q11", "b", "q12"],
["q12", "\u0019", "q13"],
["q13", "\u0019", "q14"],
["q13", "\u0019", "q10"],
["q14", "c", "q15"],
["q15", "\u0019", "q7"],
["q0", "\u0019", "q16"],
["q16", "a", "q17"],
["q17", "\u0019", "q18"],
["q18", "\u0019", "q19"],
["q19", "b", "q20"],
["q20", "\u0019", "q21"],
["q21", "\u0019", "q22"],
["q21", "\u0019", "q18"],
["q22", "a", "q23"],
["q23", "\u0019", "q7"]
]
}

```

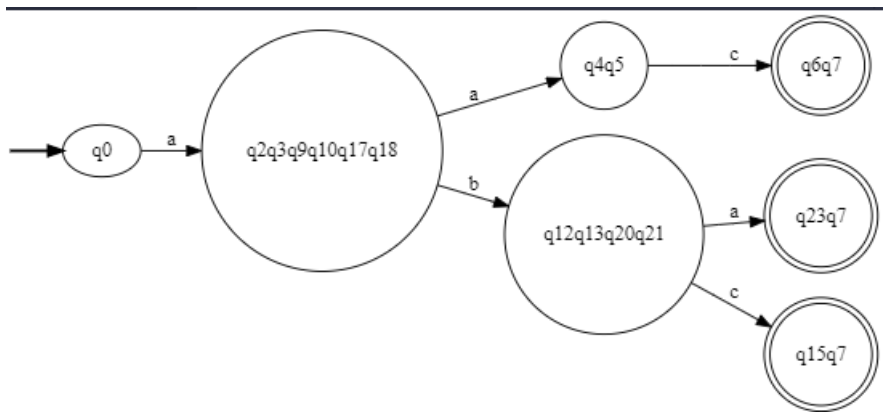


```
{
  "alphabet": ["a", "c", "b"],
  "states": ["q0", "q1", "q2", "q3", "q4", "q5", "q6", "q7", "q8", "q9", "q10", "q13", "q11", "q12", "q14", "q15", "q16", "q17", "q18", "q19", "q20", "q21", "q22", "q23"],
  "initial_state": "q0",
  "accepting_states": ["q7"],
  "transitions": [
    ["q0", "a", "q2"], ["q0", "a", "q3"], ["q0", "a", "q9"], ["q0", "a", "q10"], ["q0", "a", "q17"], ["q0", "a", "q18"], ["q1", "a", "q2"], ["q1", "a", "q3"], ["q2", "a", "q4"], ["q2", "a", "q5"], ["q3", "a", "q4"], ["q3", "a", "q5"], ["q8", "a", "q9"], ["q8", "a", "q10"], ["q16", "a", "q17"], ["q16", "a", "q18"], ["q21", "a", "q23"], ["q21", "a", "q7"], ["q22", "a", "q23"], ["q22", "a", "q7"], ["q4", "c", "q6"], ["q4", "c", "q7"], ["q5", "c", "q6"], ["q5", "c", "q7"], ["q13", "c", "q15"], ["q13", "c", "q7"], ["q14", "c", "q15"], ["q14", "c", "q7"], ["q10", "b", "q12"], ["q10", "b", "q13"], ["q11", "b", "q12"], ["q11", "b", "q13"], ["q18", "b", "q20"], ["q18", "b", "q21"], ["q19", "b", "q20"], ["q19", "b", "q21"], ["q19", "b", "q21"]
  ]
}
```



Resultado NFA

```
{
  "alphabet": ["a", "c", "b"],
  "states": [
    ["q0"],
    ["q2", "q3", "q9", "q10", "q17", "q18"],
    ["q4", "q5"],
    ["q12", "q13", "q20", "q21"],
    ["q6", "q7"],
    ["q23", "q7"],
    ["q15", "q7"]
  ],
  "initial_state": "q0",
  "accepting_states": [
    ["q6", "q7"],
    ["q23", "q7"],
    ["q15", "q7"]
  ],
  "transitions": [
    ["q0", "a", "q2q3q9q10q17q18"],
    ["q2q3q9q10q17q18", "a", "q4q5"],
    ["q2q3q9q10q17q18", "b", "q12q13q20q21"],
    ["q4q5", "c", "q6q7"],
    ["q12q13q20q21", "a", "q23q7"],
    ["q12q13q20q21", "c", "q15q7"]
  ]
}
```



Resultado DFA

Regex	Resultado
aac	<div>EVALUATE JSON</div> <div>--> q0 a q2q3q9q10q17q18</div> <div>--> q2q3q9q10q17q18 a q4q5</div> <div>--> q4q5 c q6q7</div> <div>The expresion is part of the automata lenguaje</div>
aba	<div>EVALUATE JSON</div> <div>--> q0 a q2q3q9q10q17q18</div> <div>--> q2q3q9q10q17q18 b q12q13q20q21</div> <div>--> q12q13q20q21 a q23q7</div> <div>The expresion is part of the automata lenguaje</div>
ab	<div>EVALUATE JSON</div> <div>--> q0 a q2q3q9q10q17q18</div> <div>--> q2q3q9q10q17q18 b q12q13q20q21</div> <div>The expresion is not part of the automata lenguaje</div>
aaaa	<div>EVALUATE JSON</div> <div>--> q0 a q2q3q9q10q17q18</div> <div>--> q2q3q9q10q17q18 a q4q5</div> <div>--> q4q5 a ∅</div> <div>The expresion is not part of the automata lenguaje</div>

abc

EVALUATE JSON

--> q0 a q2q3q9q10q17q18

--> q2q3q9q10q17q18 b q12q13q20q21

--> q12q13q20q21 c q15q7

The expresion is part of the automata lenguaje