

# Teoría de Autómatas y Lenguajes Formales

## Actividades Práctica 2

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# Enunciado

Consideraremos el lenguaje sobre el alfabeto  $\{a, b\}$  que solo contenga la cadena  $a$ .

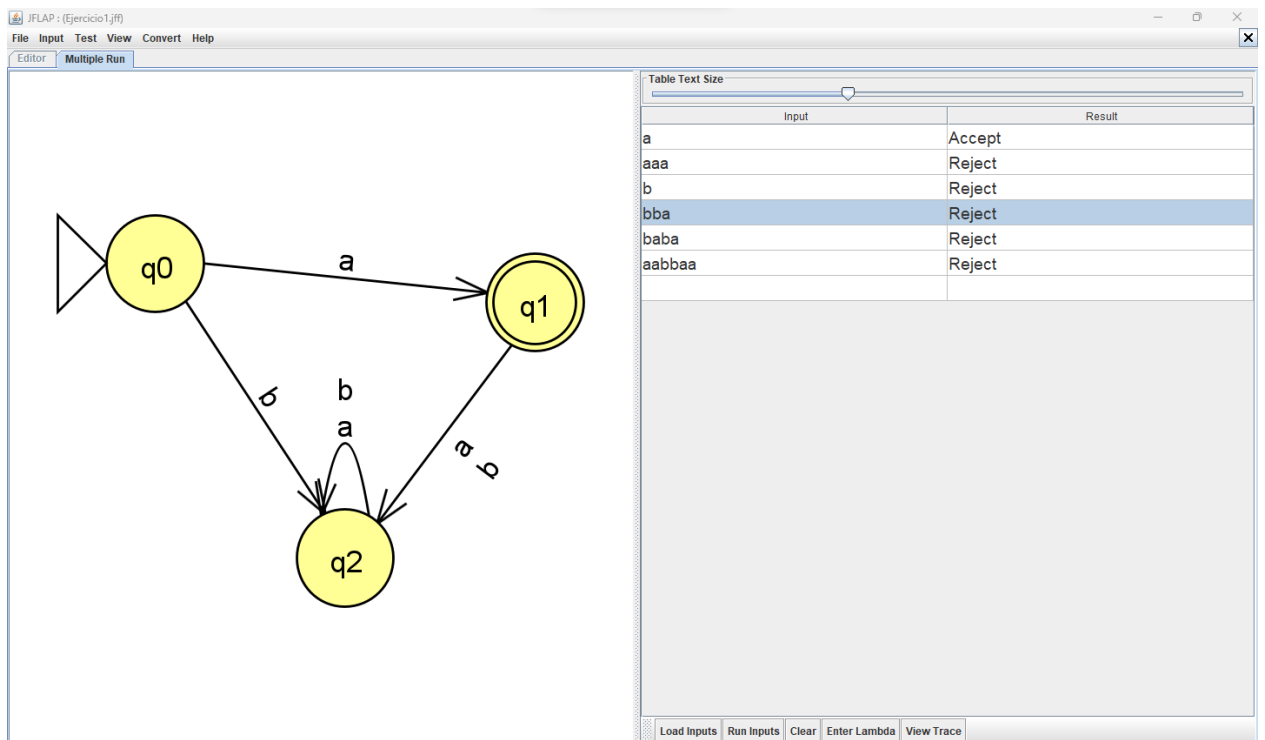
## Apartado 1

Descripción matemática del autómata: Sea  $M = (\{q_0, q_1, q_2\}, \{a, b\}, \delta, q_0, \{q_1\})$  un AFD con

$\delta(q, \sigma)$	$a$	$b$
$q_0$	$q_1$	$q_2$
$q_1$	$q_2$	$q_2$
$q_2$	$q_2$	$q_2$

## Apartado 2

Hacer el autómata que reconozca el lenguaje y rechaze todas aquellas cadenas que no pertenezcan a dicho lenguaje en JLFAP. Además, se prueba el autómata introduciendo 6 cadenas:



## Apartado 3

Describir el JSON en Octave:

The image displays two screenshots of the Octave IDE, showing the process of defining finite automata in JSON format. The interface includes a File Browser, Workspace, Command Window, and Command History.

**Workspace Table:**

Name	Class	Dimension	Value	Attribute
ans	logical	1x1	0	

**Command History:**

```
powerrelation({'11', '12', '23', '34'}, 3)
# Octave 6.4.0, Sat Oct 29 13:37:39 2022 CEST <ivan@ubuntu-virtualMachine>
finiteautomaton("aa*bb*", "ab")
finiteautomaton("a", "ab", "LaTeX")
finiteautomaton("a", "a", "LaTeX")
finiteautomaton("a", "aaa", "LaTeX")
finiteautomaton("a", "b", "LaTeX")
finiteautomaton("a", "bba", "LaTeX")
```

**Command Window:**

```
>> finiteautomaton("a", "a", "LaTeX")
SM = (\{q_0, q_1, q_2\}, \{a, b\}, \{(q_0, a, q_1), (q_0, b, q_2), (q_1, a, q_2), (q_1, b, q_2), (q_2, a, q_2), (q_2, b, q_2)\}, q_0, \{q_1\})$
$w = a$
$(q_0, a) \vdash (q_1, \text{varepsilon})$
 $x \in \mathcal{L}(M)$ 
ans = 1
>> finiteautomaton("a", "aaa", "LaTeX")
SM = (\{q_0, q_1, q_2\}, \{a, b\}, \{(q_0, a, q_1), (q_0, b, q_2), (q_1, a, q_2), (q_1, b, q_2), (q_2, a, q_2), (q_2, b, q_2)\}, q_0, \{q_1\})$
$w = aaa$
$(q_0, aaa) \vdash (q_1, aa) \vdash (q_2, a) \vdash (q_2, \text{varepsilon})$
 $x \notin \mathcal{L}(M)$ 
ans = 0
>> finiteautomaton("a", "b", "LaTeX")
SM = (\{q_0, q_1, q_2\}, \{a, b\}, \{(q_0, a, q_1), (q_0, b, q_2), (q_1, a, q_2), (q_1, b, q_2), (q_2, a, q_2), (q_2, b, q_2)\}, q_0, \{q_1\})$
$w = b$
$(q_0, b) \vdash (q_2, \text{varepsilon})$
 $x \notin \mathcal{L}(M)$ 
ans = 0
>> finiteautomaton("a", "bba", "LaTeX")
SM = (\{q_0, q_1, q_2\}, \{a, b\}, \{(q_0, a, q_1), (q_0, b, q_2), (q_1, a, q_2), (q_1, b, q_2), (q_2, a, q_2), (q_2, b, q_2)\}, q_0, \{q_1\})$
$w = bba$
$(q_0, b) \vdash (q_2, \text{varepsilon})$
 $x \notin \mathcal{L}(M)$ 
ans = 0
>> finiteautomaton("a", "baba", "LaTeX")
SM = (\{q_0, q_1, q_2\}, \{a, b\}, \{(q_0, a, q_1), (q_0, b, q_2), (q_1, a, q_2), (q_1, b, q_2), (q_2, a, q_2), (q_2, b, q_2)\}, q_0, \{q_1\})$
$(q_0, baba) \vdash (q_2, aba) \vdash (q_2, ba) \vdash (q_2, a) \vdash (q_2, \text{varepsilon})$
 $x \notin \mathcal{L}(M)$ 
ans = 0
>> finiteautomaton("a", "aabbaa", "LaTeX")
SM = (\{q_0, q_1, q_2\}, \{a, b\}, \{(q_0, a, q_1), (q_0, b, q_2), (q_1, a, q_2), (q_1, b, q_2), (q_2, a, q_2), (q_2, b, q_2)\}, q_0, \{q_1\})$
$(q_0, aabbaa) \vdash (q_1, abbaa) \vdash (q_2, bbaa) \vdash (q_2, baa) \vdash (q_2, aa) \vdash (q_2, a) \vdash (q_2, \text{varepsilon})$
 $x \notin \mathcal{L}(M)$ 
ans = 0
```