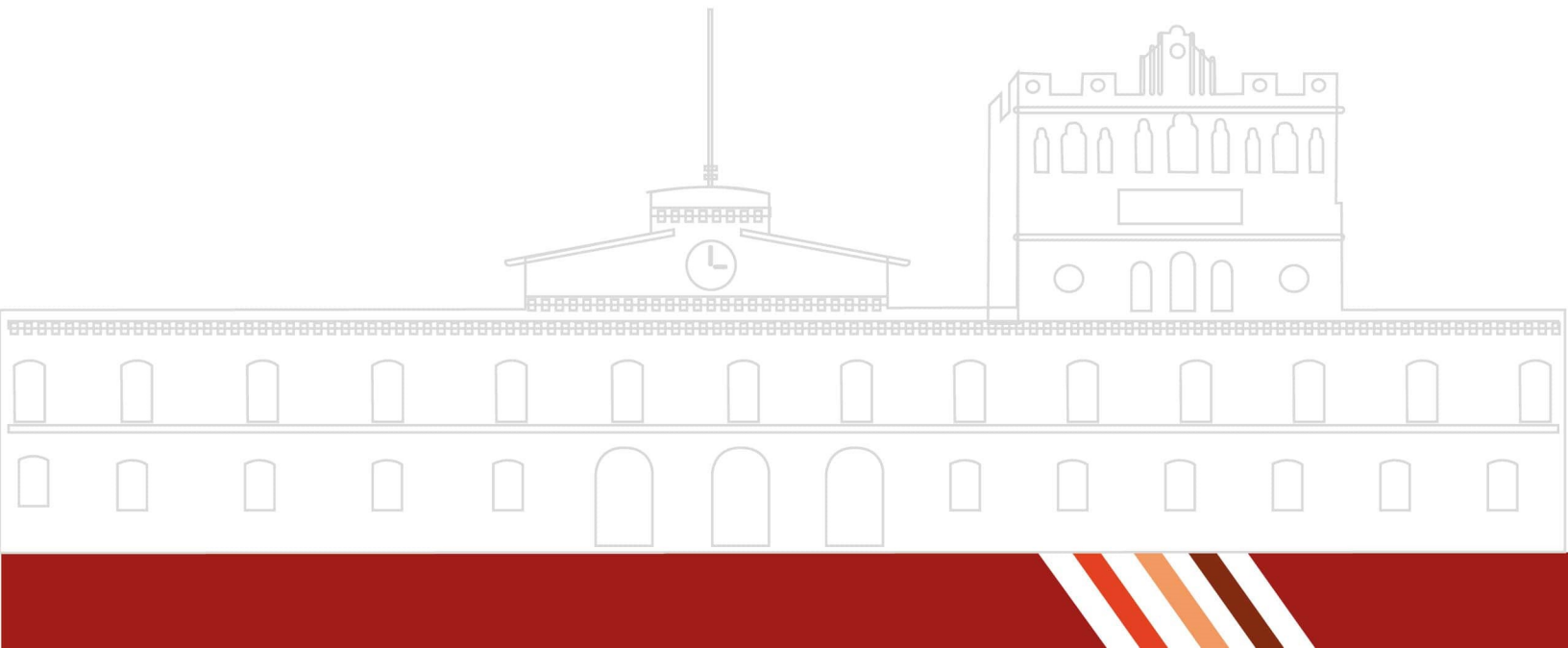


Ejercicios en Automaton Simulator

ALUMNO: Ian Alejandro Jaen Cruz
Dr. Eduardo Cornejo-Velázquez



1. Ejercicios

1. Obtenga un Autómata Finito Determinista (AFD) dado el lenguaje definido en el alfabeto $\Sigma = \{0, 1\}$, que acepte el conjunto de palabras que inician en "0".

$$\Sigma = \{0, 1\}, \quad Q = \{a, b\}, \quad q_0 = a, \quad F = \{b\}$$

$$f = \begin{cases} f(a, 0) = b \\ f(b, 0) = b \\ f(b, 1) = b \end{cases}$$

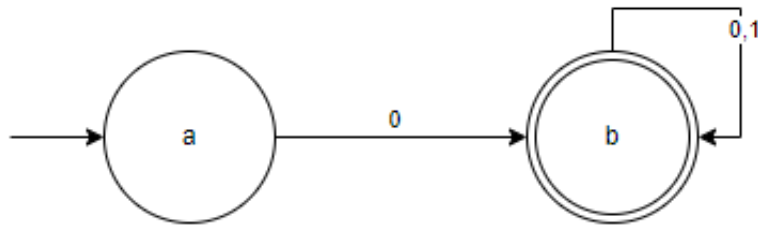


Figure 1: Diagrama de Transicion

	0	1
a	b	
b	b	b

Table 1: Tabla de transicion

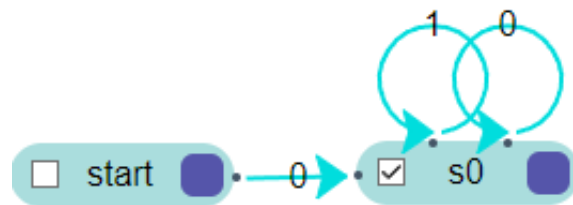


Figure 2: Simulación

```

Accept: 01 -- Pass
Accept: 001 -- Pass
Accept: 011 -- Pass
Accept: 0100 -- Pass
Accept: 010 -- Pass
Reject: 10 -- Pass
Reject: 100 -- Pass
Reject: 1000 -- Pass
Reject: 10000 -- Pass

```

Figure 3: Palabras

2. Obtenga un Autómata Finito Determinista (AFD) que acepte el conjunto de palabras que terminan en “1”.

$$\Sigma = \{0, 1\}, \quad Q = \{a, b\}, \quad q_0 = a, \quad F = \{b\}$$

$$f = \begin{cases} f(a, 0) = a \\ f(a, 1) = b \\ f(b, 0) = a \\ f(b, 1) = b \end{cases}$$

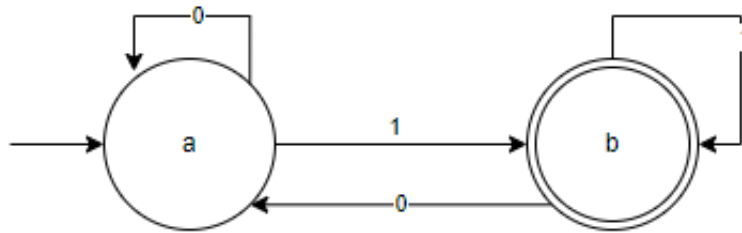


Figure 4: Diagrama de Transición

	0	1
a	a	b
b	a	b

Table 2: Tabla de transición

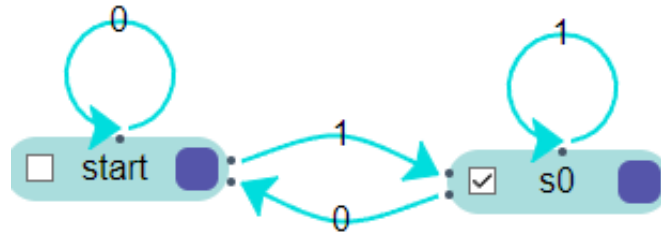


Figure 5: Simulación

```

Accept: 0001 -- Pass
Accept: 010101 -- Pass
Accept: 01010101 -- Pass
Accept: 111010101 -- Pass
Reject: 101010 -- Pass
Reject: 000 -- Pass
Reject: 110 -- Pass
Reject: 10 -- Pass
Reject: 00 -- Pass

```

Figure 6: Palabras

3. Obtenga un Autómata Finito Determinista (AFD) que acepte palabras que contienen la subcadena "01".

$$\Sigma = \{0, 1\}, \quad Q = \{a, b, c\}, \quad q_0 = a, \quad F = \{c\}$$

$$f = \begin{cases} f(a, 0) = b \\ f(a, 1) = a \\ f(b, 0) = b \\ f(b, 1) = c \\ f(c, 0) = c \\ f(c, 1) = c \end{cases}$$

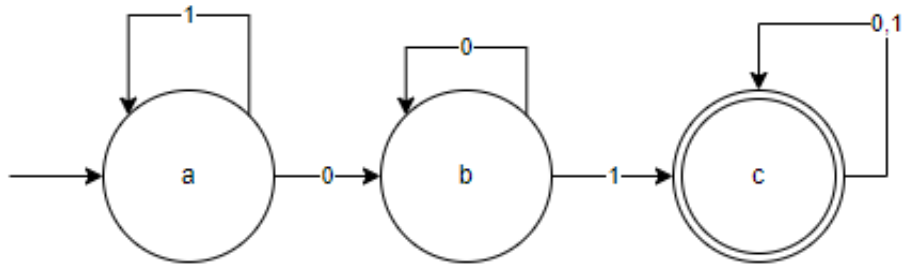


Figure 7: Diagrama de Transición

	0	1
a	b	a
b	b	c
c	c	c

Table 3: Tabla de transición

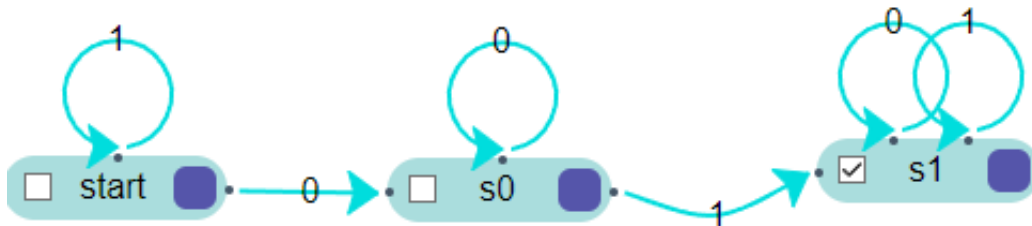


Figure 8: Simulación

```

Accept: 0001 -- Pass
Accept: 010101 -- Pass
Accept: 01010101 -- Pass
Accept: 111010101 -- Pass
Reject: 11110 -- Pass
Reject: 000 -- Pass
Reject: 110 -- Pass
Reject: 10 -- Pass
Reject: 00 -- Pass
  
```

Figure 9: Palabras

4. Obtenga un Autómata Finito Determinista (AFD) que acepte palabras que no contienen la subcadena "01".

$$\Sigma = \{0, 1\}, \quad Q = \{a, b, c\}, \quad q_0 = a, \quad F = \{a, b\}$$

$$f = \begin{cases} f(a, 0) = b \\ f(a, 1) = a \\ f(b, 0) = b \\ f(b, 1) = c \\ f(c, 0) = c \\ f(c, 1) = c \end{cases}$$

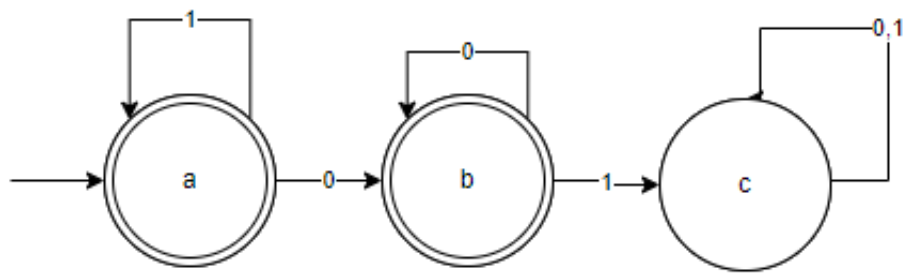


Figure 10: Diagrama de Transicion

	0	1
a	b	a
b	b	c
c	c	c

Table 4: Tabla de transicion

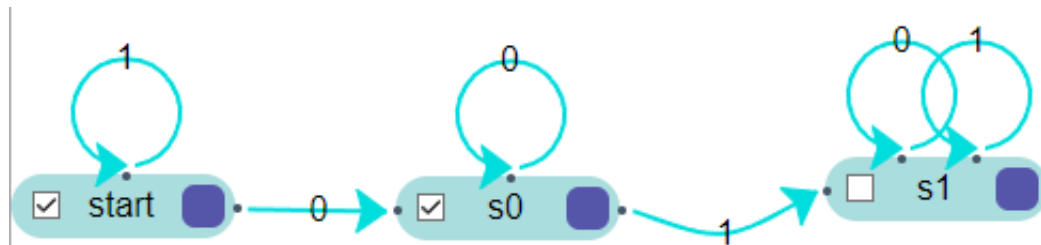


Figure 11: Simulación

```

Accept: 0001 -- Pass
Accept: 010101 -- Pass
Accept: 01010101 -- Pass
Accept: 111010101 -- Pass
Reject: 11110 -- Pass
Reject: 000 -- Pass
Reject: 110 -- Pass
Reject: 10 -- Pass
Reject: 00 -- Pass

```

Figure 12: Palabras

5. Obtenga un Autómata Finito Determinista (AFD) en $\Sigma = \{a, b, c\}$ que acepte palabras que inician con “ac” o terminan con “ab”.

$$\Sigma = \{a, b, c\}, \quad Q = \{a, b, c, d, e, f\}, \quad q_0 = a, \quad F = \{c, f\}$$

$$f = \begin{cases} f(a, a) = b \\ f(a, b) = d \\ f(a, c) = d \\ f(b, c) = c \\ f(b, b) = f \\ f(b, a) = e \\ f(c, a) = c \\ f(c, b) = c \\ f(c, c) = c \\ f(d, b) = d \\ f(d, c) = d \\ f(d, a) = e \\ f(e, c) = d \\ f(e, a) = e \\ f(e, b) = f \\ f(f, a) = e \\ f(f, b) = d \\ f(f, c) = d \end{cases}$$

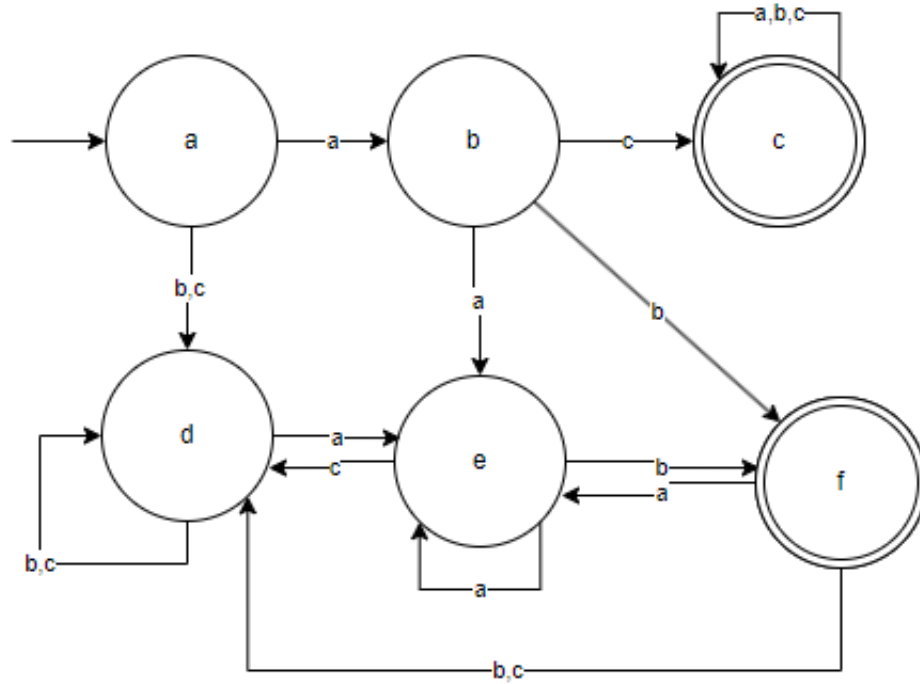


Figure 13: Diagrama de Transición

	a	b	c
a	b	d	d
b	e	f	c
c	c	c	c
d	e	d	d
e	e	f	d
f	e	d	d

Table 5: Tabla de transicion

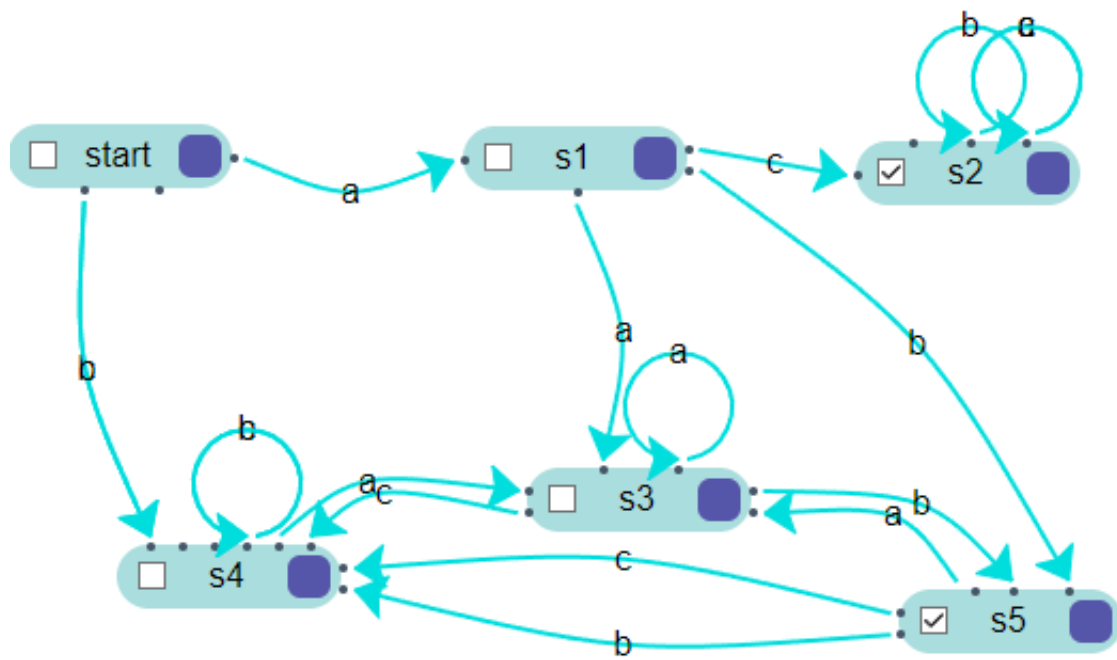


Figure 14: Simulación

```

Accept: accc -- Pass
Accept: accacab -- Pass
Accept: cccab -- Pass
Accept: ab -- Pass
Reject: aaccb -- Pass
Reject: bbca -- Pass
Reject: ca -- Pass
Reject: aba -- Pass
Reject: ca -- Pass

```

Figure 15: Palabras

6. Obtenga un Autómata Finito Determinista (AFD) en $\Sigma = \{a, b, c\}$ que inician con “ac” y no terminan con “ab”.

$$\Sigma = \{a, b, c\}, \quad Q = \{a, b, c, d, e, f\}, \quad q_0 = a, \quad F = \{e\}$$

$$f = \begin{cases} f(a, a) = b \\ f(a, b) = f \\ f(a, c) = f \\ f(b, a) = f \\ f(b, b) = f \\ f(b, c) = c \\ f(c, a) = d \\ f(c, b) = c \\ f(c, c) = c \\ f(d, a) = d \\ f(d, b) = e \\ f(d, c) = c \\ f(e, a) = d \\ f(e, b) = c \\ f(e, c) = c \\ f(f, a) = f \\ f(f, b) = f \\ f(f, c) = f \end{cases}$$

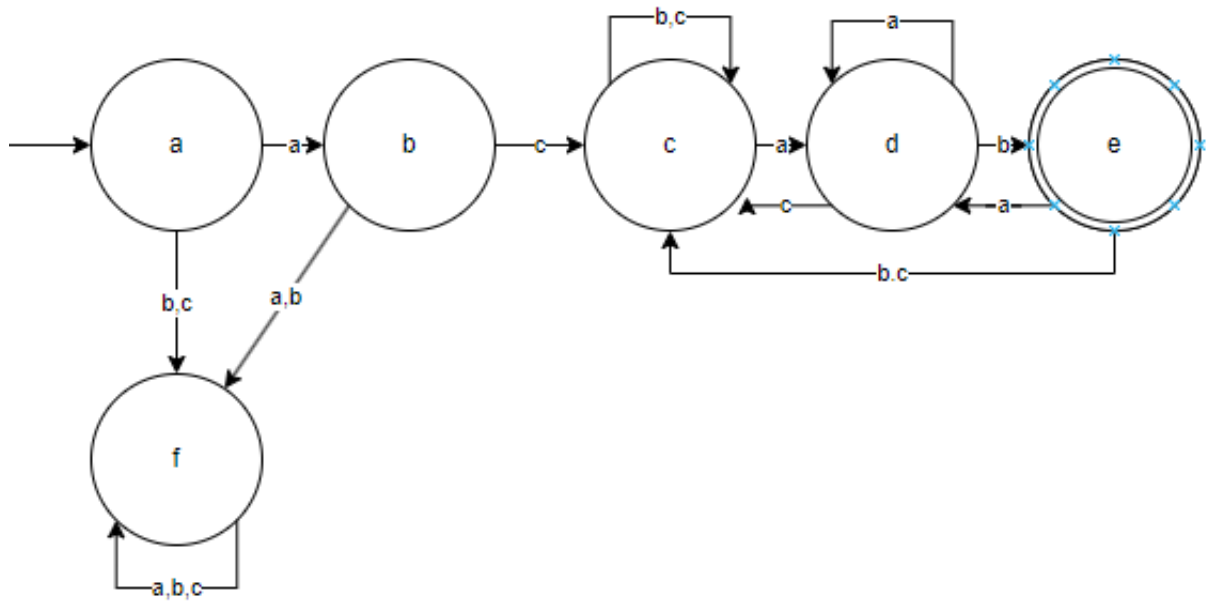


Figure 16: Diagrama de Transición

	a	b	c
a	b	f	f
b	f	f	c
c	d	c	c
d	d	e	c
e	d	c	c
f	f	f	f

Table 6: Tabla de transición

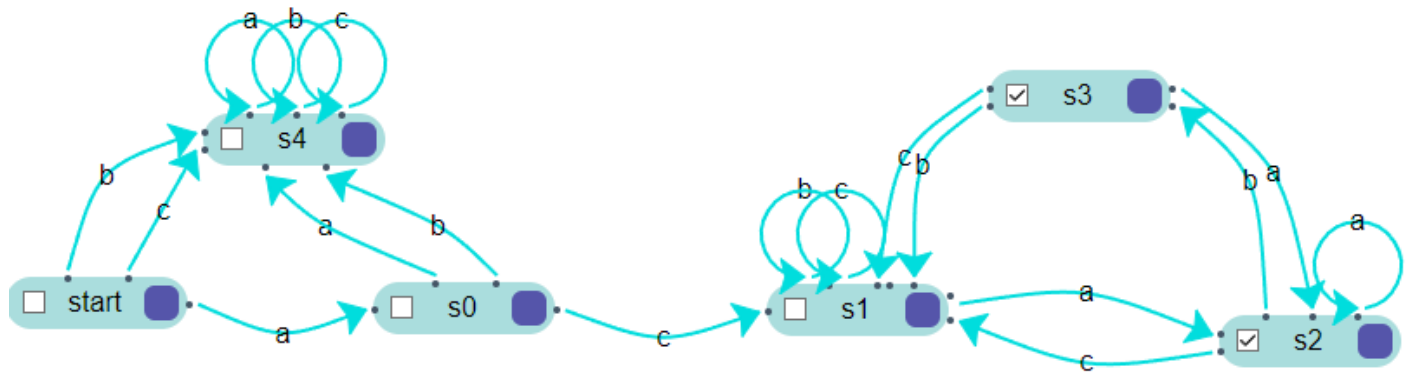


Figure 17: Simulación

```

Accept: acccab -- Pass
Accept: acab -- Pass
Accept: acaaaab -- Pass
Accept: accccabbab -- Pass
Accept: acacbcab -- Pass
Reject: caba -- Pass
Reject: ccc -- Pass
Reject: bbb -- Pass
Reject: ba -- Pass
Reject: ca -- Pass

```

Figure 18: Palabras

7. Obtenga un Autómata Finito Determinista (AFD) en $\Sigma = \{a, b, c\}$ que inician con “ac” o no terminan con “ab”.

$$\Sigma = \{a, b, c\}, \quad Q = \{a, b, c, d, e, f\}, \quad q_0 = a, \quad F = \{e\}$$

$$f = \begin{cases} f(a, a) = b \\ f(a, b) = d \\ f(a, c) = d \\ f(b, a) = e \\ f(b, b) = f \\ f(b, c) = c \\ f(c, a) = c \\ f(c, b) = c \\ f(c, c) = c \\ f(d, a) = e \\ f(d, b) = d \\ f(d, c) = d \\ f(e, a) = e \\ f(e, b) = f \\ f(e, c) = d \\ f(f, a) = e \\ f(f, b) = d \\ f(f, c) = d \end{cases}$$

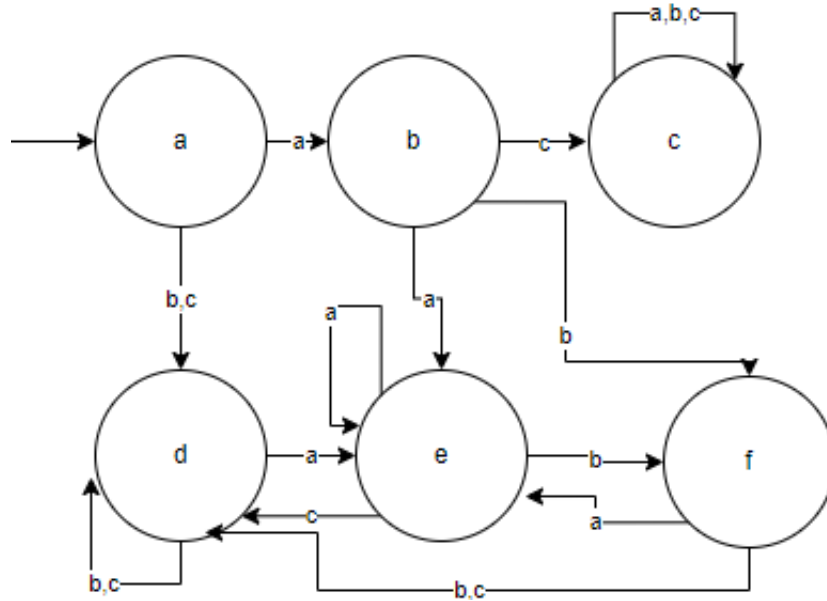


Figure 19: Diagrama de Transición

	a	b	c
a	b	d	d
b	e	f	c
c	c	c	c
d	e	d	d
e	e	f	d
f	e	d	d

Table 7: Tabla de transicion

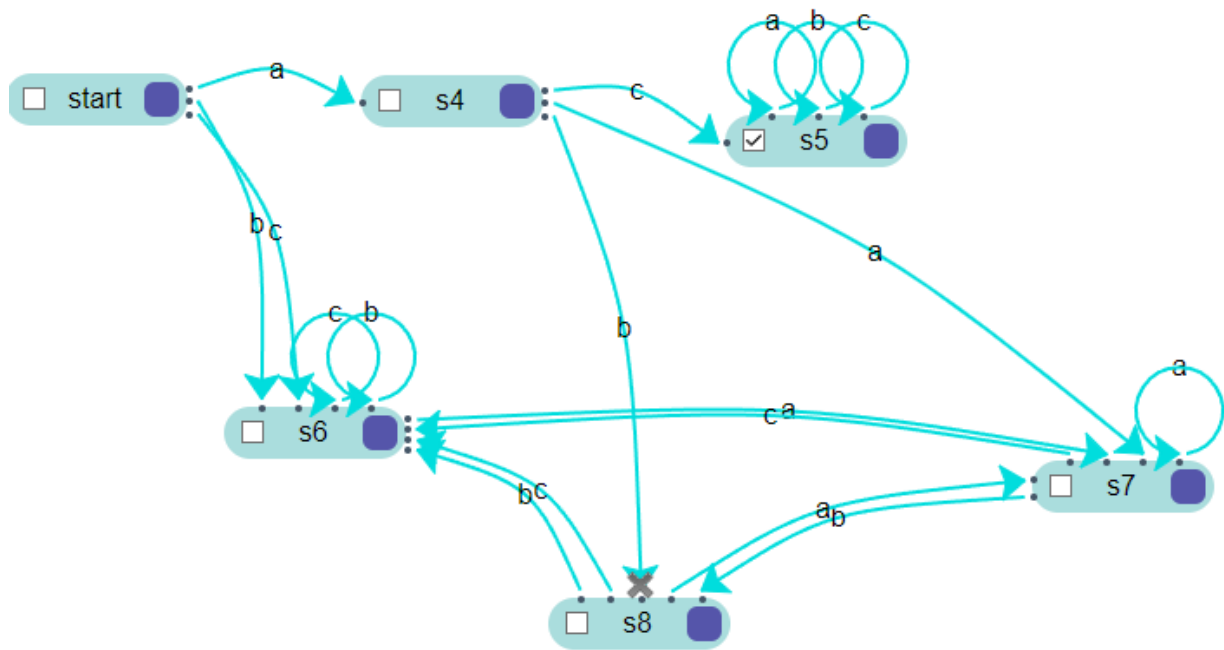


Figure 20: Simulación

```

Accept: acccab -- Pass
Accept: acab -- Pass
Accept: ac -- Pass
Accept: accccabbab -- Pass
Accept: acacbcab -- Pass
Reject: caba -- Pass
Reject: ccc -- Pass
Reject: bbb -- Pass
Reject: ba -- Pass
Reject: ca -- Pass
  
```

Figure 21: Palabras

8. Obtenga un Autómata Finito Determinista (AFD) en $\Sigma = \{a, b, c\}$ que no inician con “ac” y no terminan con “ab”.
9. Obtenga un Autómata Finito No Determinista (AFND) en $\Sigma = \{0, 1\}$ que acepte palabras que no contienen la subcadena “01”.
10. Obtenga un Autómata Finito No Determinista (AFND) en $\Sigma = \{a, b, c\}$ que acepte palabras que inician con “ac” y terminan con “ab”.