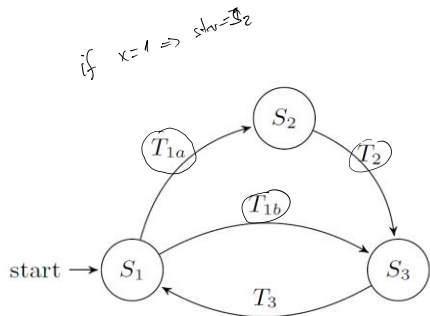


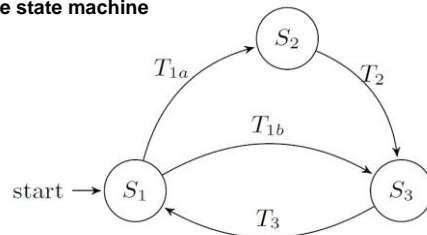
Stavový automat



1

Stavový automat

FSM – Finite state machine

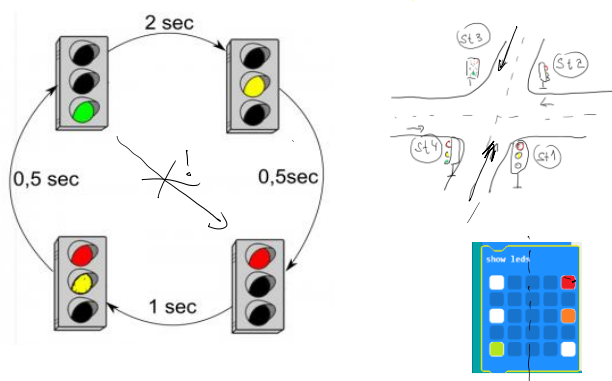


Formal definition: A FSM is a five-tuple $\mathcal{A} = (S, \Sigma, \delta, s_0, F)$, where:

- S is a finite, non-empty set of states,
- Σ is the input alphabet (a finite, non-empty set of symbols),
- δ is the transition function: $\delta : S \times \Sigma \rightarrow S$,
- s_0 is the initial state, $s_0 \in S$ and
- F is the final state set, $F \subseteq S$.

2

Stavový automat – príklad



3

Stavový automat – príklad

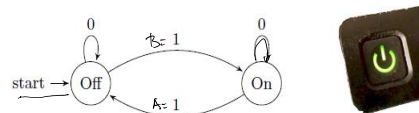


Fig. 4. FSM diagram for on/off switch.

4

Stavový automat

Fig. 4. FSM diagram for on/off switch.

5

Stavový automat

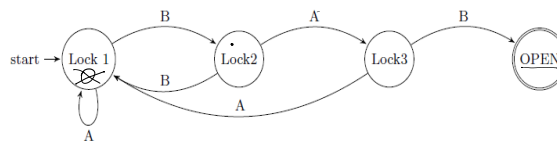
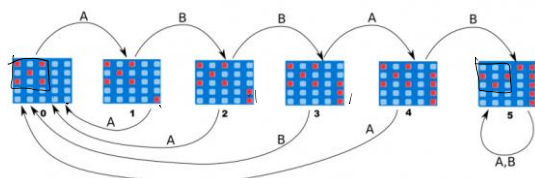


Fig. 5. FSM diagram for simple code lock. Opening sequence is B-A-B.



6

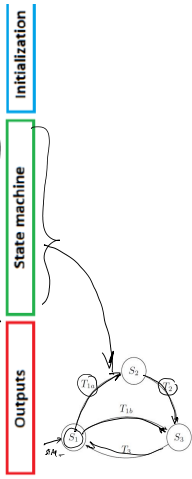
```

on start
  set State to 1
  set timer to 0

run in background
while true
  pause (ms) 100
  change timer by 100

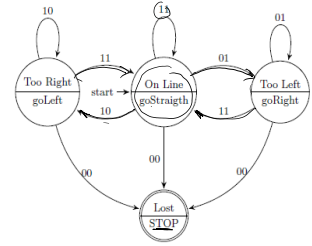
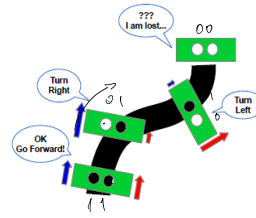
Forever
  if State = 1 and Transition_Condition_T1a
  then set State to 2
  else if State = 1 and Transition_Condition_T1b
  then set State to 3
  else if State = 2 and Transition_Condition_T2
  then set State to 3
  else if State = 3 and Transition_Condition_T3
  then set State to 1

  if State = 1
  then call function SetOutputs_1
  if State = 2
  then call function SetOutputs_2
  if State = 3
  then call function SetOutputs_3
  
```



7

Stavový automat



8

Stavový automat

State machine implementation (part only)

```

Forever
  call function ReadSensors
  if State = 44 OnLine
  then if Sensors = 44 00
  then set State to 44 Lost
  else if Sensors = 44 01
  then set State to 44 TooRight
  else if Sensors = 44 00
  then set State to 44 TooLeft
  else if Sensors = 44 01
  then set State to 44 OnLine
  else if State = 44 TooLeft
  then if Sensors = 44 00
  then set State to 44 Lost
  else if Sensors = 44 01
  then set State to 44 TooLeft
  else if Sensors = 44 01
  then set State to 44 OnLine
  
```

Execution part – setting outputs

```

if State = 44 OnLine
then move left motor forward at 75
  move right motor forward at 75
  pause (ms) 50
else if State = 44 TooRight
then move lefts motor forward at 75
  move right motor forward at 25
  pause (ms) 50
else if State = 44 TooLeft
then move lefts motor forward at 25
  move right motor forward at 75
  pause (ms) 50
else if State = 44 Lost
then turn motors OFF
  turn motors OFF
  
```

video

slido

9

10