State Machine

State machines are a method of modeling systems whose output depends on the entire history of their inputs, and not just on the most recent input.

Traffic light can be a good example. The traffic light will go from red to yellow to green and back to red. The traffic light both depend on the number given by before part and what user inputs . History will tell it what to do next and the input will let the program to go forward. What history gives we can name it “S”,the input can be named as “I” and the out can renamed as “O”.

For example this is how traffic light works:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| time | 0 | 1 | 2 | 3 | 4 | 5 |
| input—i | “ ” | “ “ | “ “ | “ “ | “ “ | “ “ |
| state—s | 0 | 1 | 2 | 0 | 1 | 2 |
| output—o | forward | forward | back | forward | forward | back |