Finite State Automata Worksheet

1. Determine which of the following strings would be accepted by the FSA below.
   1. 0
   2. 0111010
   3. 0000000001
   4. The empty string
   5. 010

A diagram of a number and circles

Description automatically generated

1. Fill in the missing information (e.g., start state and transitions) in the FSA below such that it accepts binary strings with the prefix “01”.

A diagram of a diagram

Description automatically generated

1. Fill in the missing information in the FSA below such that it accepts binary strings where the number of “1”s is a multiple of 5.

A diagram of a hexagon with circles and arrows

Description automatically generated

1. Create an FSA that accepts binary strings of exactly length 4.
2. Create an FSA that accepts binary strings with an even number of “1”s.
3. Create an FSA that accepts binary strings that start and end with the same symbol.
4. Create an FSA that accepts binary strings containing the substring "11”.
5. Create an FSA that accepts binary strings that end with "110”.
6. Imagine a CTA turnstile that unlocks when a coin is inserted (sensor input “0”) and locks after a person pushes through (sensor input “1”). Model this with a two-state FSA (one state for locked and one state for unlocked).
7. Imagine an automatic door with sensors. The door opens when someone approaches and closes when no one is there. Model this with an FSA.