NAME: **YVONNE KIMANI** REG NUMBER: **SCT212-0475/2017**

ASSIGNMENT

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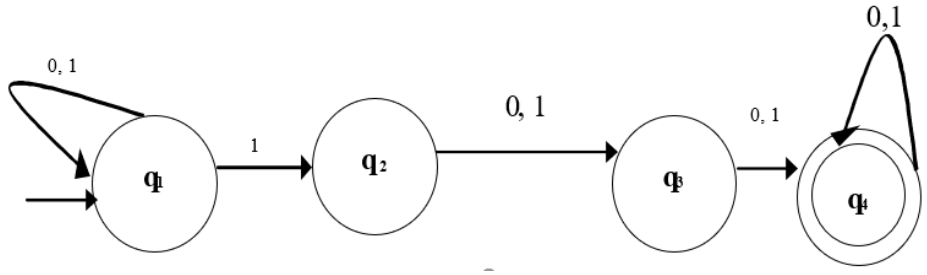
1. Provide a summary of the language recognized by the machine



Some of the possible paths that the machine can take include

$q_1 \xrightarrow{0} q_1 \xrightarrow{1} q_1 \xrightarrow{1} q_2 \xrightarrow{0} q_3 \xrightarrow{0} q_4$ String: **01100**

$q_1 \xrightarrow{1} q_2 \xrightarrow{1} q_3 \xrightarrow{1} q_4$ String: **111**

$q_1 \xrightarrow{1} q_2 \xrightarrow{1} q_3 \xrightarrow{0} q_4$ String: **110**

$q_1 \xrightarrow{0} q_1 \xrightarrow{1} q_2 \xrightarrow{1} q_3 \xrightarrow{1} q_4$ String: **0111**

$q_1 \xrightarrow{1} q_1 \xrightarrow{0} q_1 \xrightarrow{1} q_2 \xrightarrow{0} q_3 \xrightarrow{0} q_4$ String: **10100**

$q_1 \xrightarrow{1} q_2 \xrightarrow{0} q_3 \xrightarrow{0} q_4$ String: **100**

The machine recognizes the language as long as it consists of strings with at least one 1.

2. Describe how the machine transitions on input 00011.

(q2, $) ∈ δ (q1, ∈, ∈)
(q2, 0) ∈ δ (q2, 0, ∈)
(q2, 0) ∈ δ (q2, 0, ∈)
(q2, 0) ∈ δ (q2, 0, ∈)
(q3, ∈) ∈ δ (q2, 1, 0)
(q3, ∈) ∈ δ (q3, 1, 0)
(q3, ∈) ∈ δ (q3, 1, 0)
(q4, ∈) ∈ δ (q3, ∈, $)
Input string 000111 is accepted since q4 is an accept state

3. **Identify the error in the transition table provided for the same machine in the formal description.**

   $(q2, 0) \in \delta (q2, 0, \in)$

   $(q3, \in) \in \delta (q2, 1, 0)$ => Correction For the error

   $(q3, \in) \in \delta (q3, 1, 0)$

   $(q4, \in) \in \delta (q3, \in, \$)$

   $(q2, \$) \in \delta (q1, \in, \in)$

   $(q3, \in)$ is the correct transition from $(q2, 1, 0)$ not $(q2, \in)$