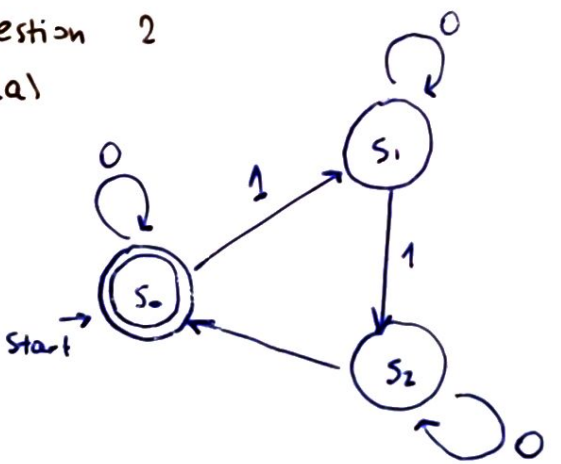
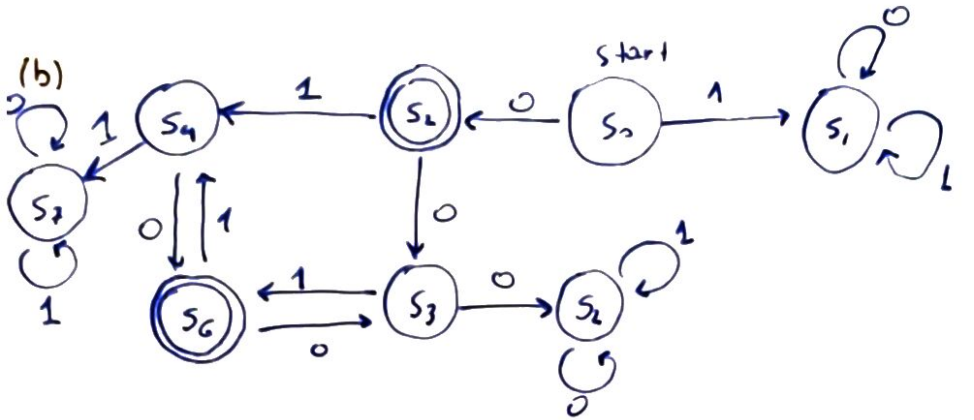
Peergrade Assignment 6

- Question 1
  - (a) No, the empty string is not accepted by this automation
  - (b) Three strings that are NOT accepted:
    bb, ba, baa
  - (c) Three strings that are accepted:
    aba, aaba, abubb
  - (d) The language recognised by A is:
    $(b^* a a^* b)(b^+ a a^* b)^* a (a|b)^*$

- Question 2
  (a)

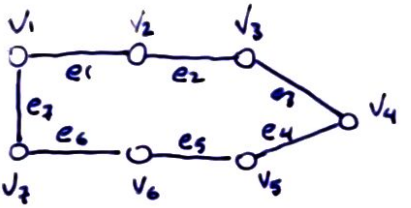


(b)



· Question 3

(a)



where V: vertices
e: edges

(b) "A connected graph (v, e, f) is connected if there exists a walk from u to v for all $u, v \in V_{11}$

Thus if we have 6 vertices, we need a minimum of 6 edges to be a connected graph.

So we cannot design a connected graph with 6 vertices and 5 edges and that has a circuit

(c) "For any binary tree with height and n leaves,
$n \leq 2^h$"

So a binary tree with:

$h = 0$, $n = 2^0 = 1$ leaf

$h = 1$, $n = 2^1 = 2$ leaves

$h = 2$, $n = 2^2 = 4$ leaves

$h = 3$, $n = 2^3 = 8$ leaves

Thus a binary tree of height 3 with 10 leaves cannot be designed