

Week 3 HW, pass tasks

i)

a)

A straight forward (not merged) regex can be

$$1^*(01^*01^*)^* \cup 0^*10^*10^*$$

The first case of the above regex was talked about in W3 tutorial. However I have moved residue 1 from the back to the front, due to it being more analytically formal as it doesn't introduce conflicting limit points of the generated sequence.

b)

According to the formation of the DFA written for W2 tutorial, a possible regex can be written as

$$000^*|(001 \cdot 0^*)|(010 \cdot 0^*)|(100 \cdot 0^*)$$

This language is regular, since it is converted from the DFA before.