

Figure 1: Q01: $L_1 = (a+b)^*a$

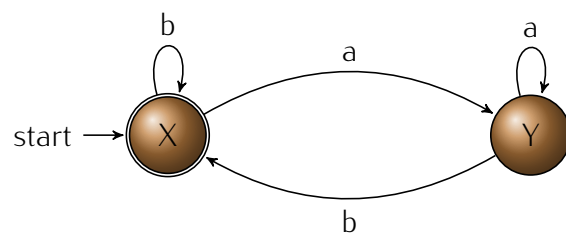


Figure 2: Q01: $L_2 = b(a+b)^*$

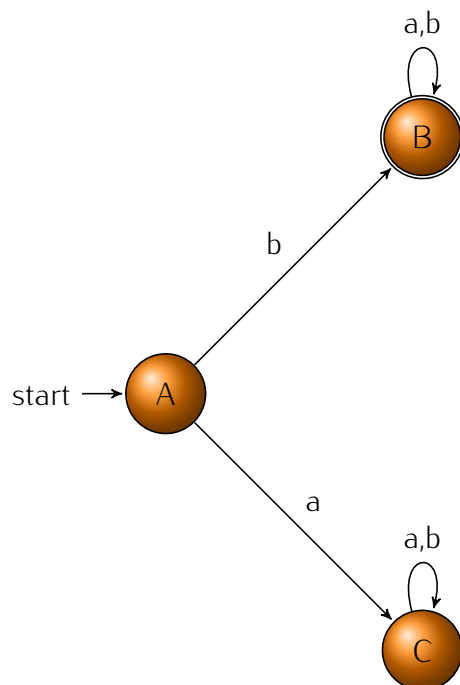


Figure 3: Q01: $L_1 \cap L_2$

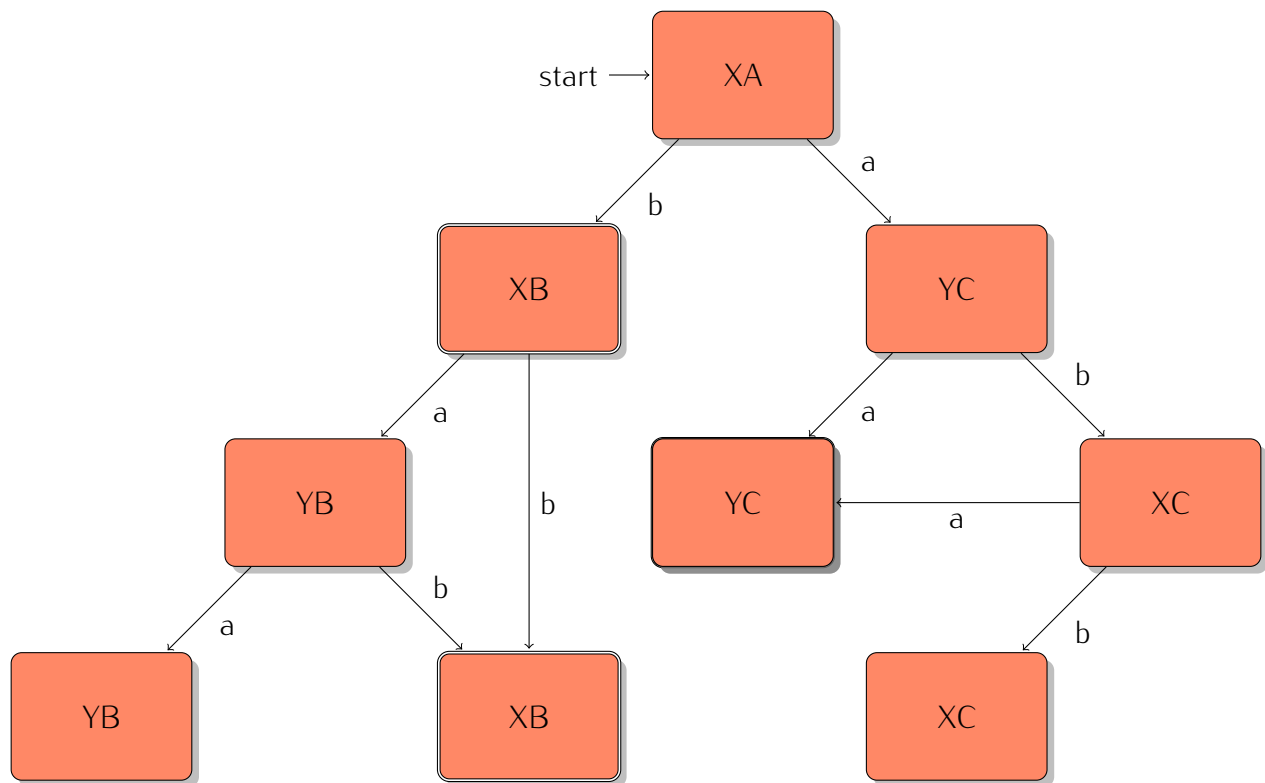


Figure 4: Q01: $L_3 = b(b+aa^*b)^*$

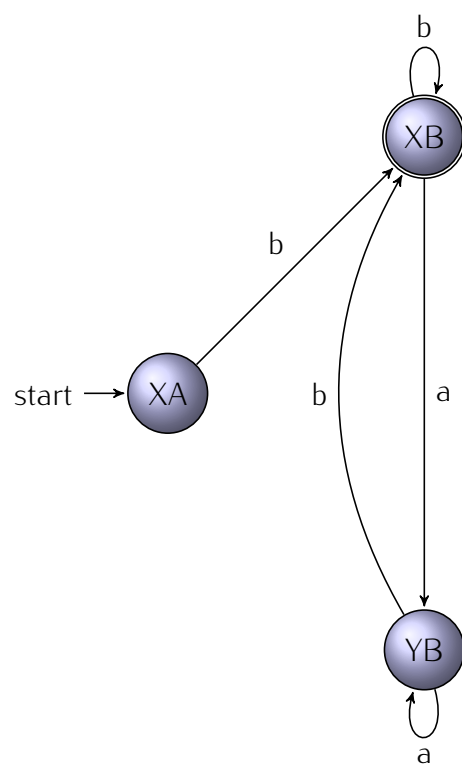


Figure 5: Q02: $L_1 = (a+b)b(a+b)^*$

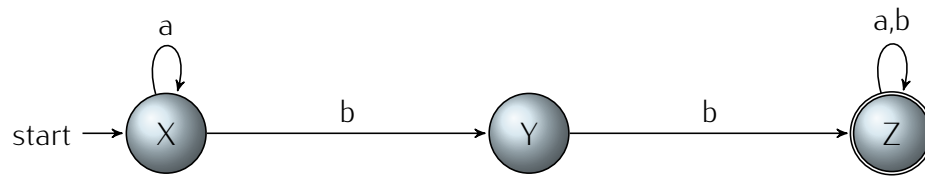


Figure 6: Q02: $L_2 = b(a+b)^*$

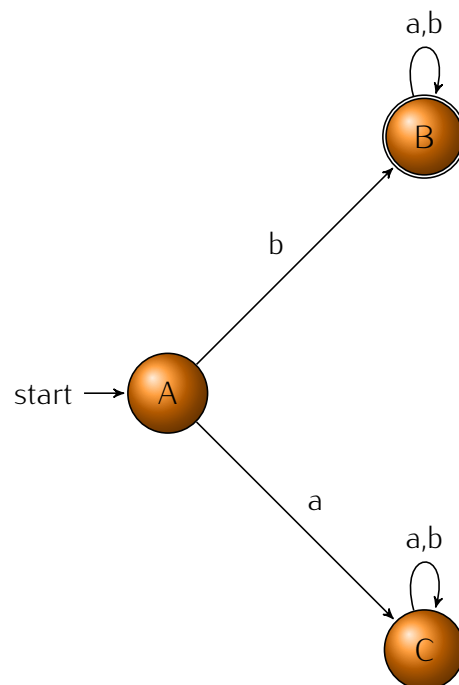


Figure 7: Q02: $L_1 \cap L_2$

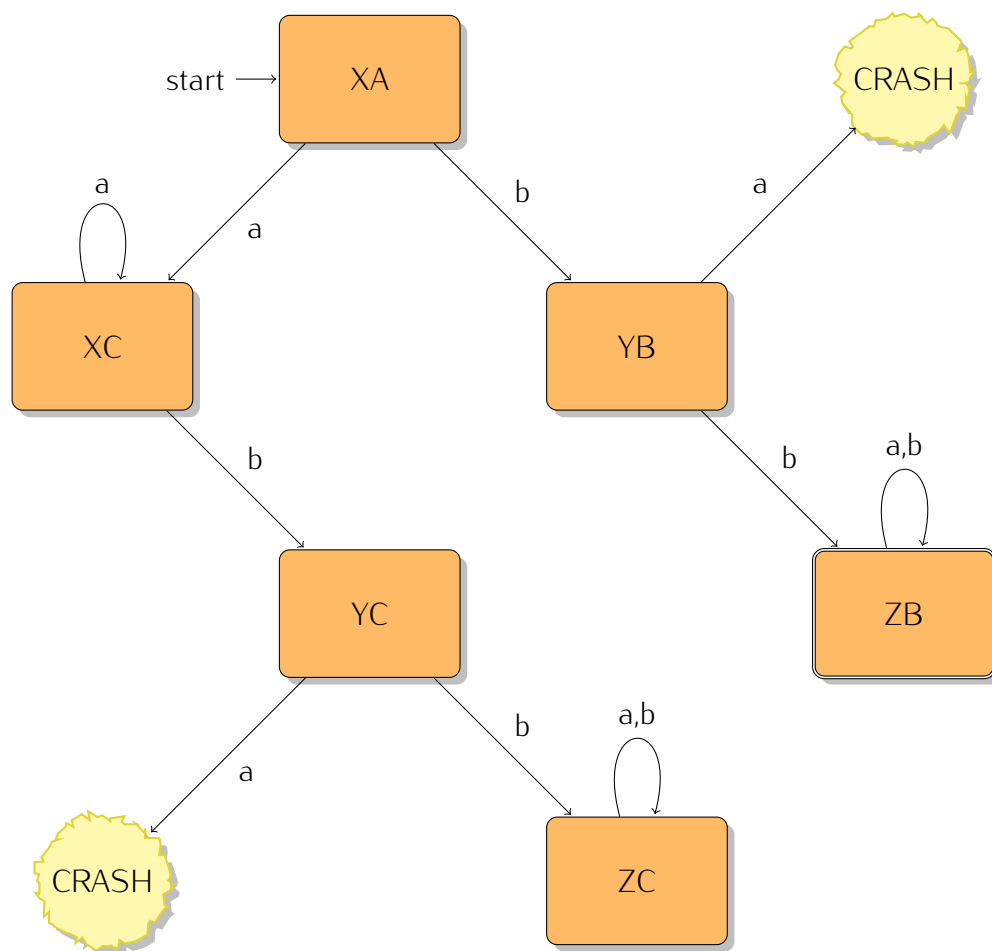


Figure 8: Q02: $L_3 = ab(a+b)^*$

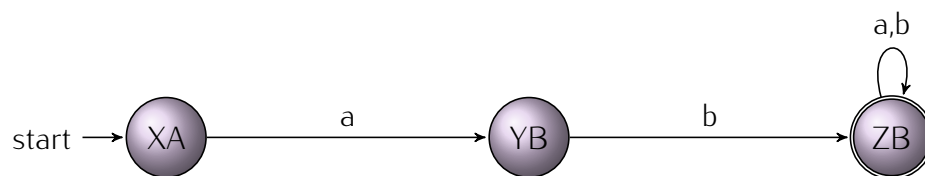


Figure 9: Q03: $L_1 = (b+ab)^*(a+\Lambda)$

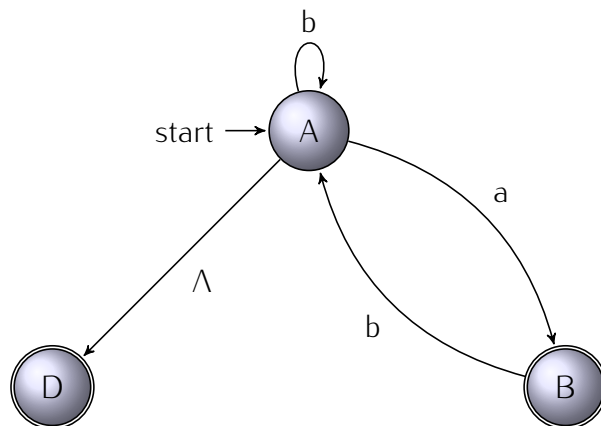


Figure 10: Q03: $L_2 = (a+b)^*aa(a+b)^*$

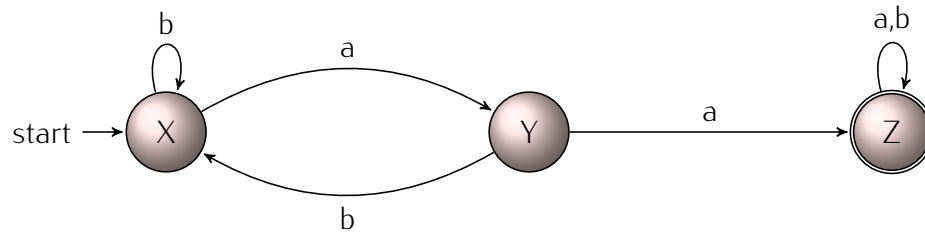


Figure 11: Q02: $L_1 \cap L_2$

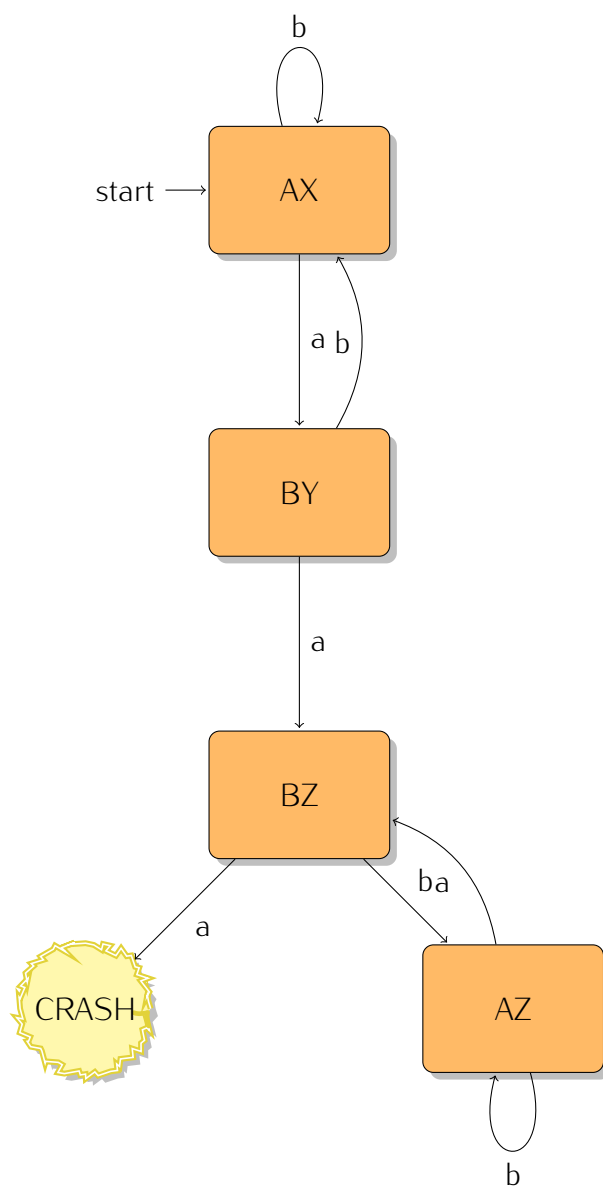


Figure 12: Q03: $L_3 = (b+ab)^*aa(bb^*a)^*$

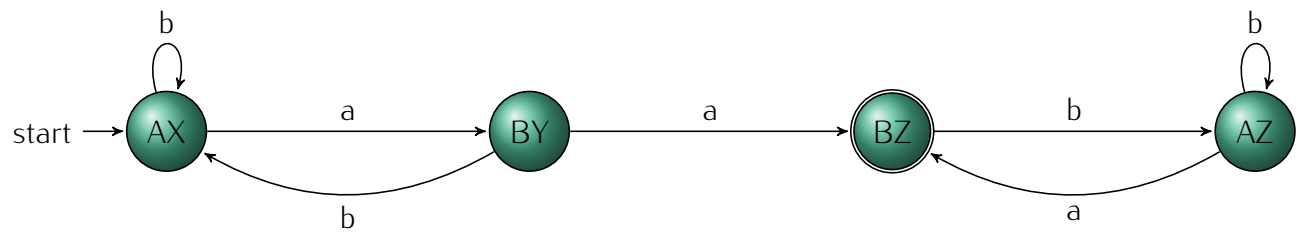


Figure 13: Q04: $L_1 = (aa+ab+ba+bb)^*$

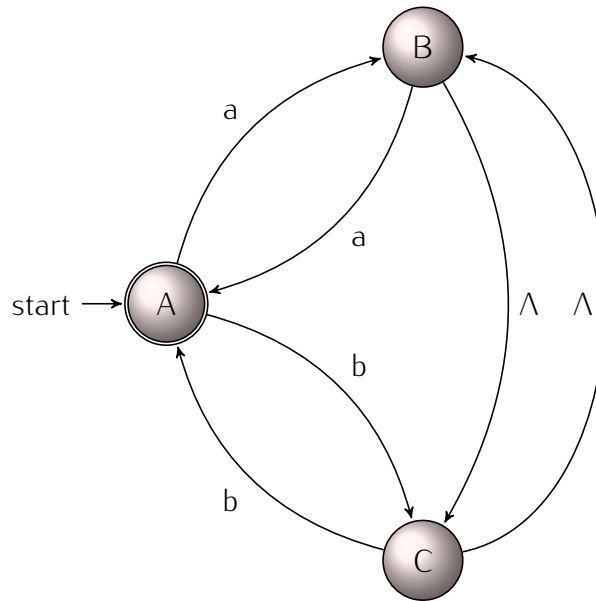


Figure 14: Q04: $L_2 = b(a+b)^*$

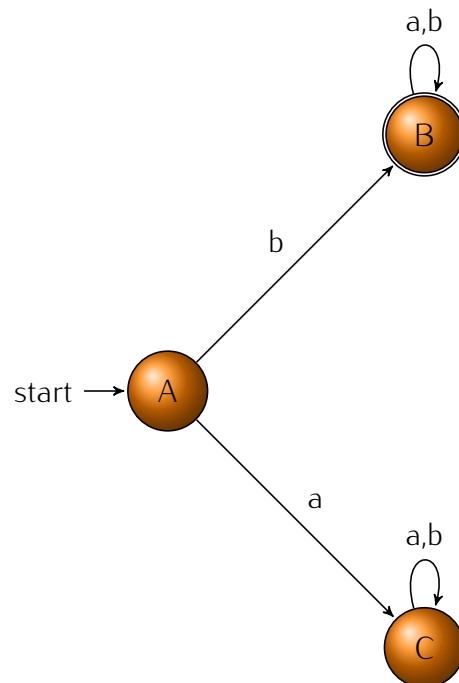


Figure 15: Q04: $L_1 \cap L_2$

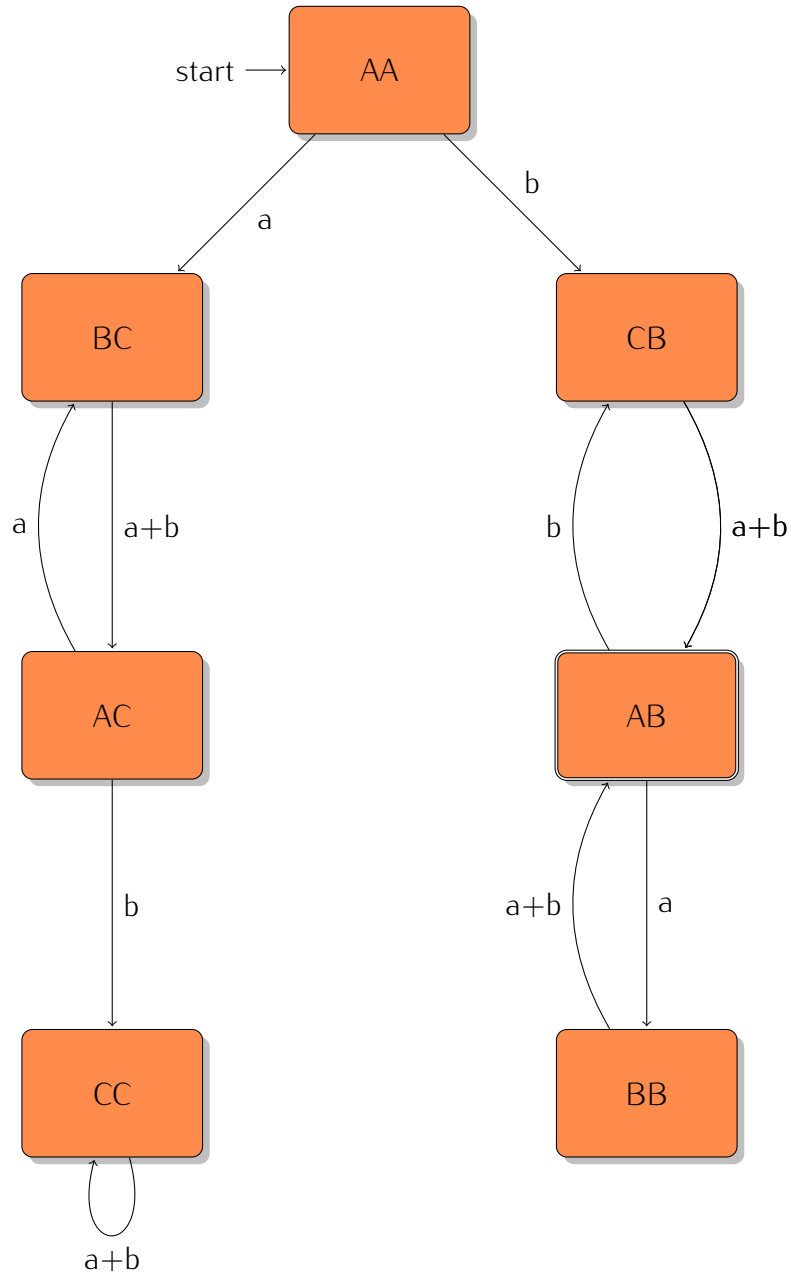


Figure 16: Q04: $L_3 = b(a+b)(b(a+b)+a(a+b))$

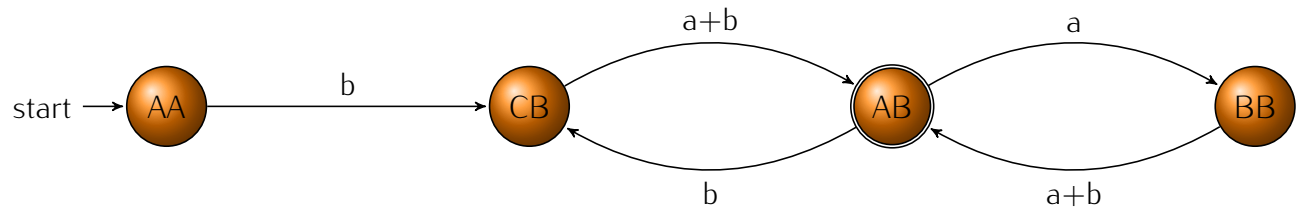


Figure 17: Q05: $L_1 = (aaa+bbb)^*$

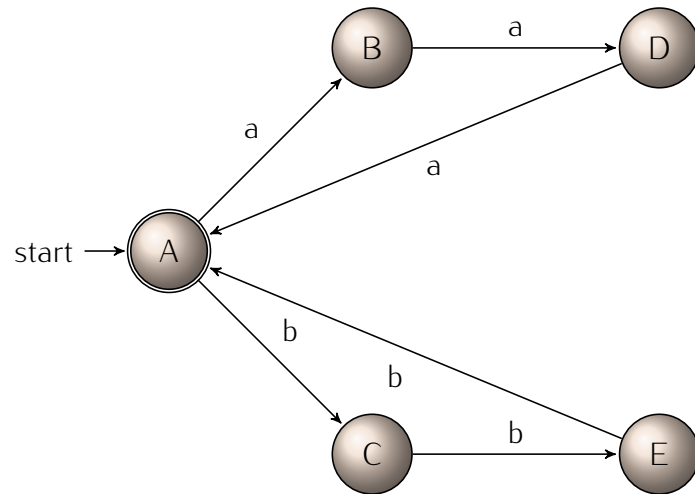


Figure 18: Q05: $L_2 = a(a+b)^*$

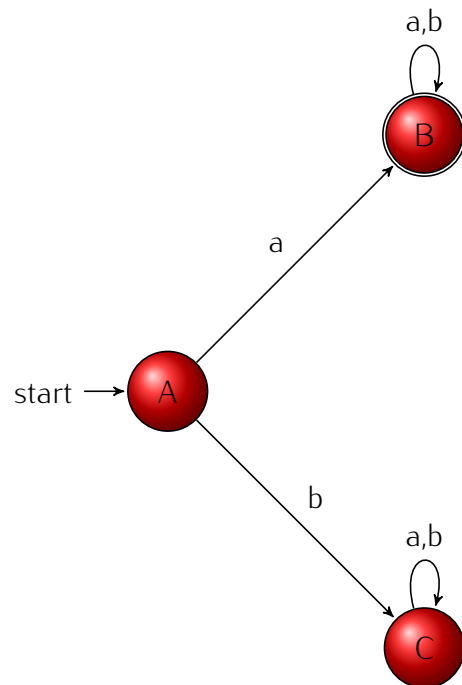


Figure 19: Q05: $L_1 \cap L_2$

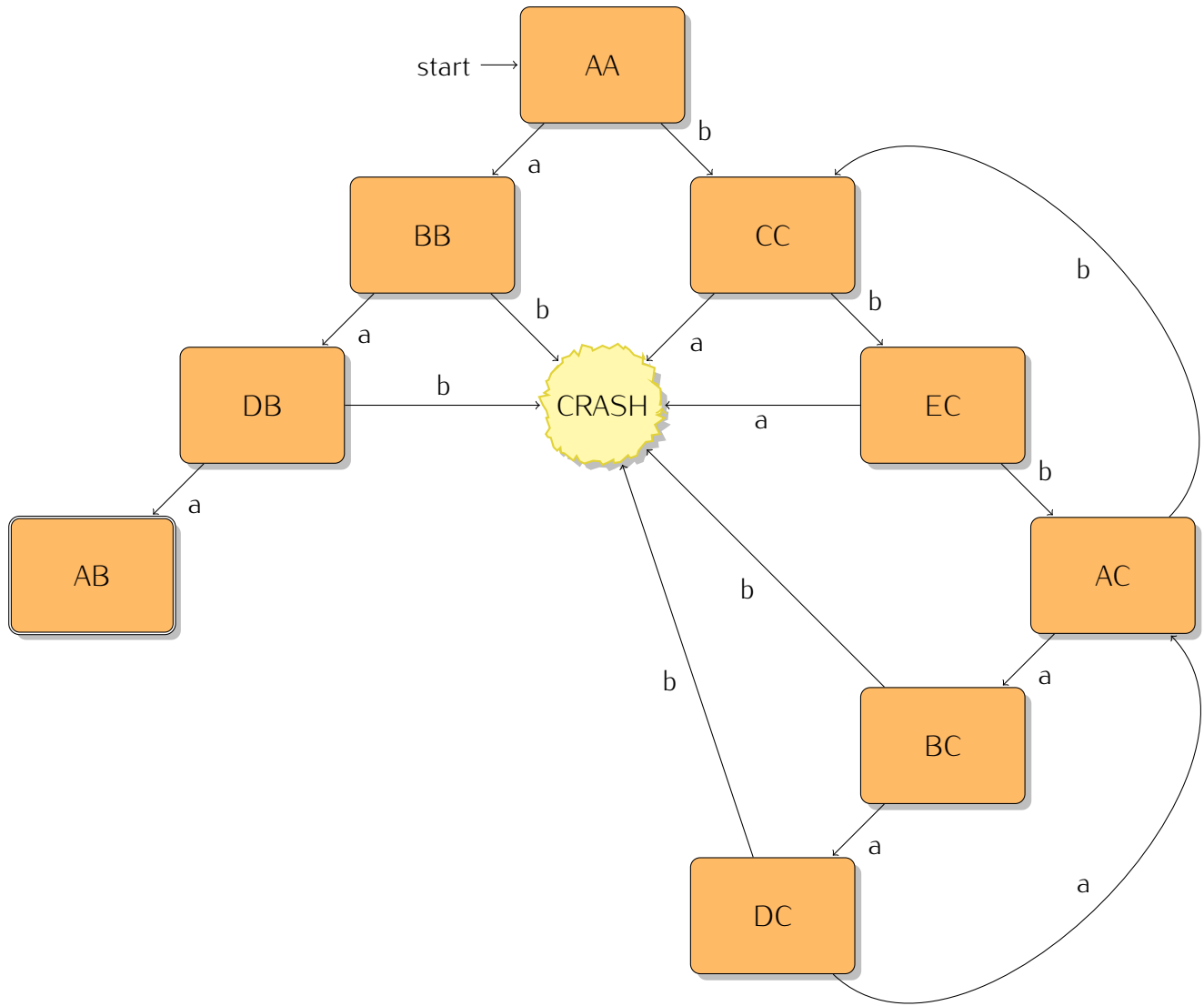


Figure 20: Q05: $L_3 = aaa$

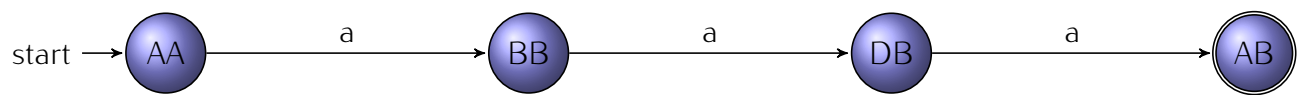


Figure 21: Q06: FA_1

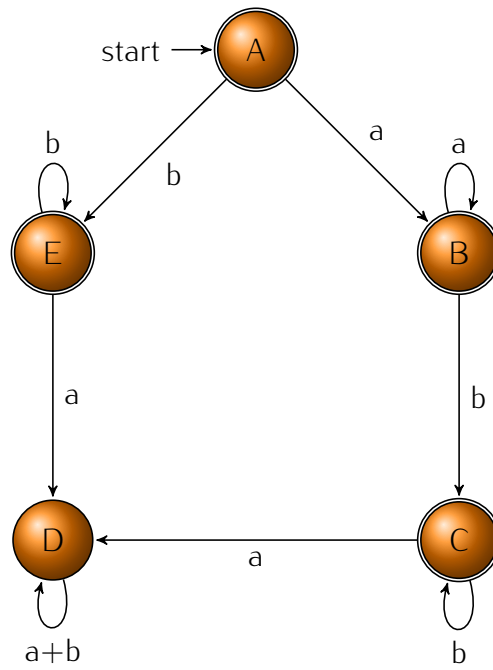


Figure 22: Q06: FA_2

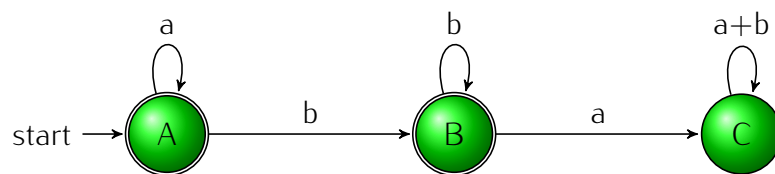
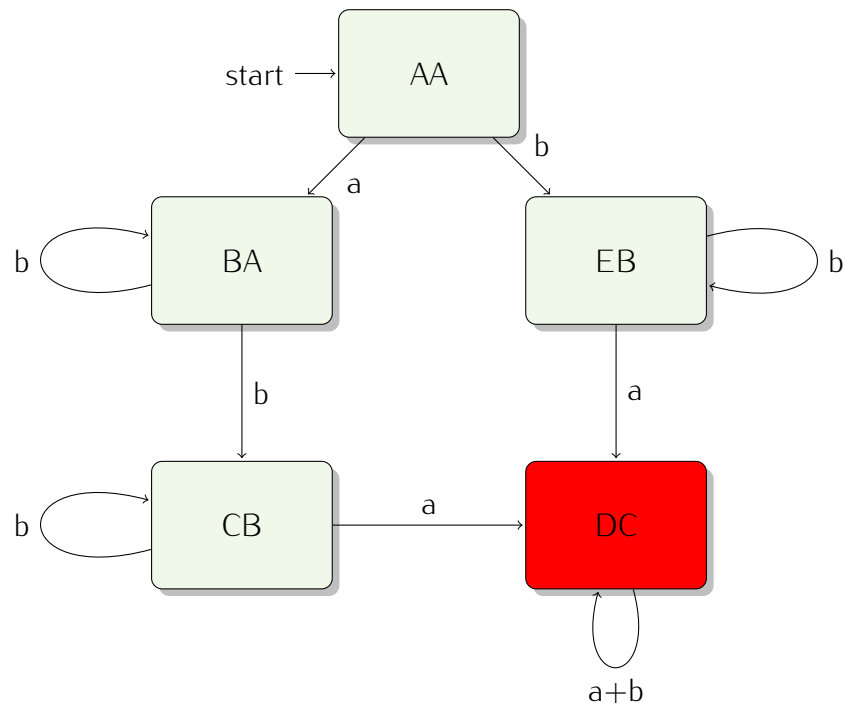


Figure 23: Q06: $L_1 \cap L_2$



Not acceptable by $L_1 \cap L_2$: DC

Acceptable by $L_1 \cap L_2$: AA, BA, CB, EB

Figure 24: Q07: FA_1

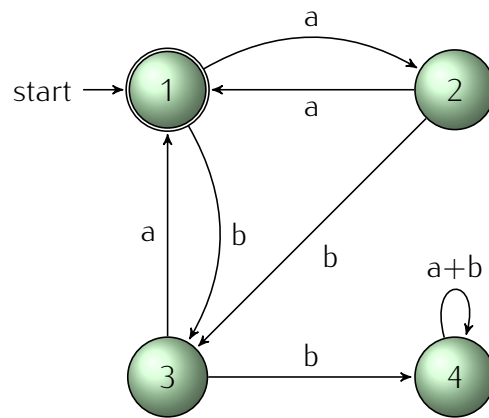
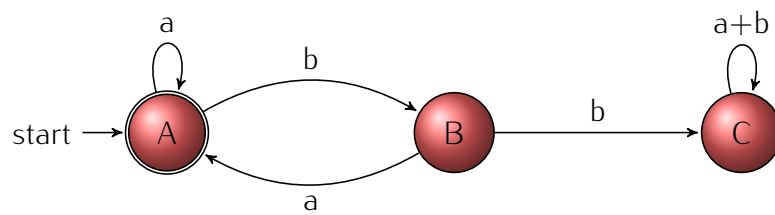


Figure 25: Q07: FA_2



The following are equivalent due to the below proofs in Figures 26-31:

Figure 26: Q07: FA'_1

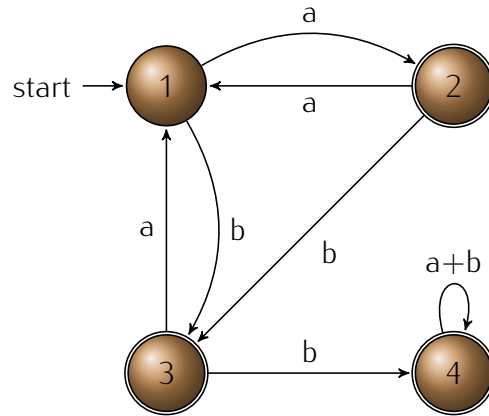


Figure 27: Q07: FA_2

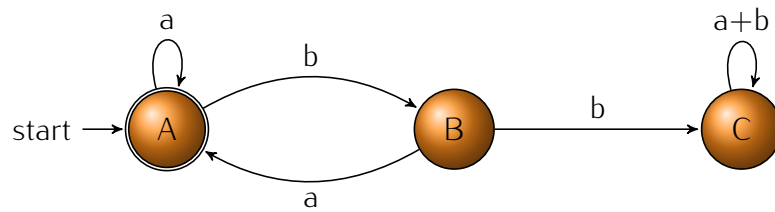


Figure 28: Q07: $(FA'_1 + FA_2)'$ No final states

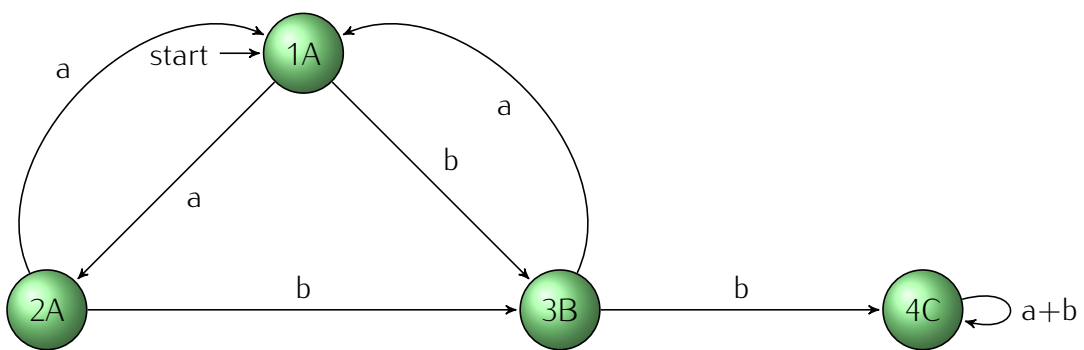


Figure 29: Q07: FA_1

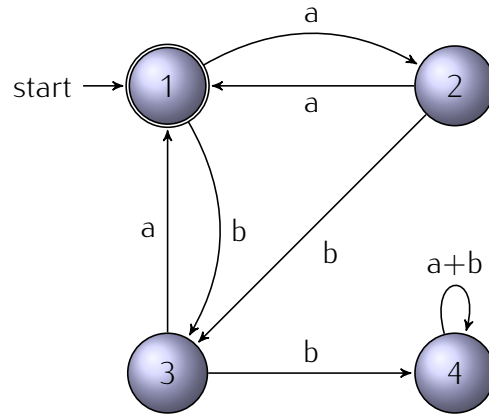


Figure 30: Q07: FA'_2

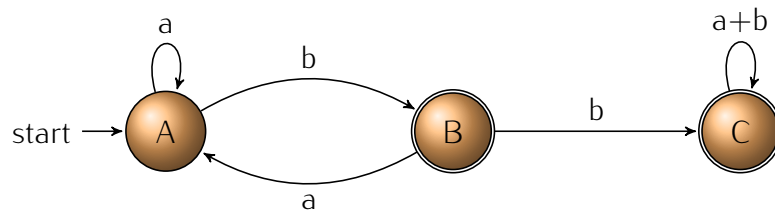


Figure 31: Q07: $(FA_1 + FA'_2)'$ No final states

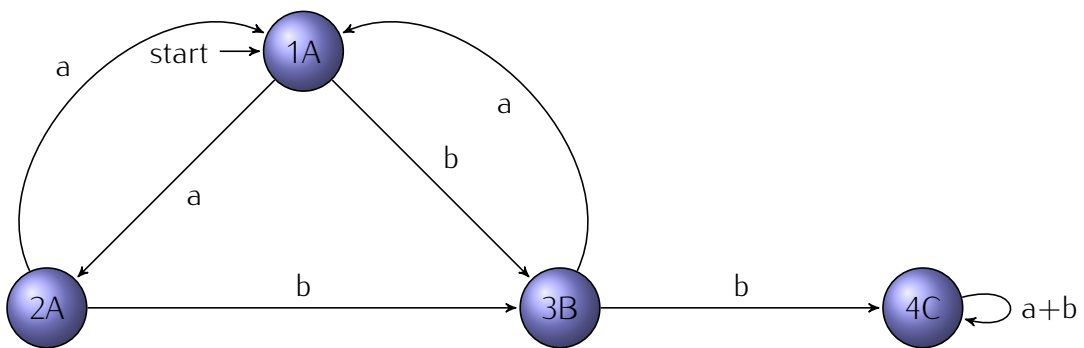


Figure 32: Q08: FA_1

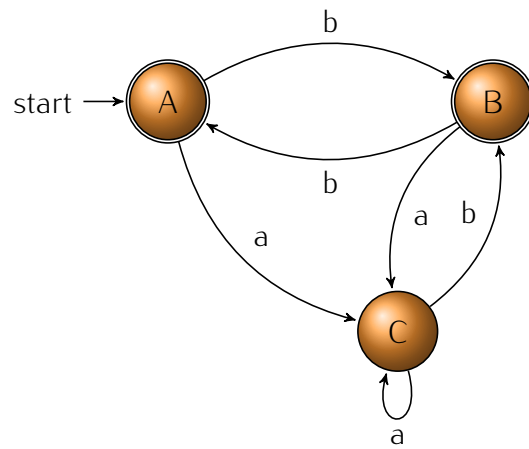


Figure 33: Q08: FA_2

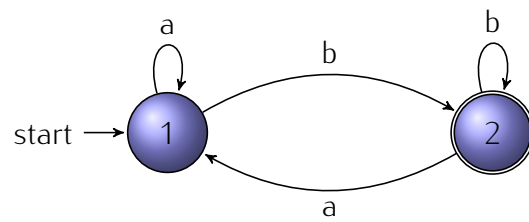
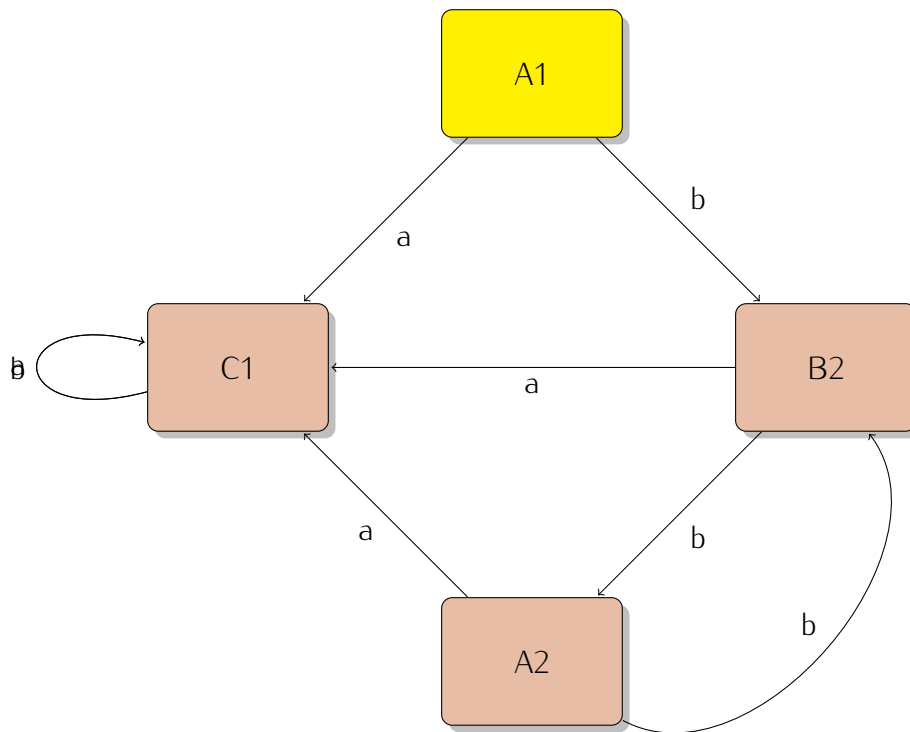


Figure 34: Q08: $L_1 \neq L_2$



Not acceptable by $L_1 \cap L_2$: C1
 Acceptable by $L_1 \cap L_2$: A2, B2
 Acceptable by L_1 only: A1, B1
 Acceptable by L_2 only: C2
 Due to A1: $L_1 \neq L_2$

Figure 35: Q09: FA_1

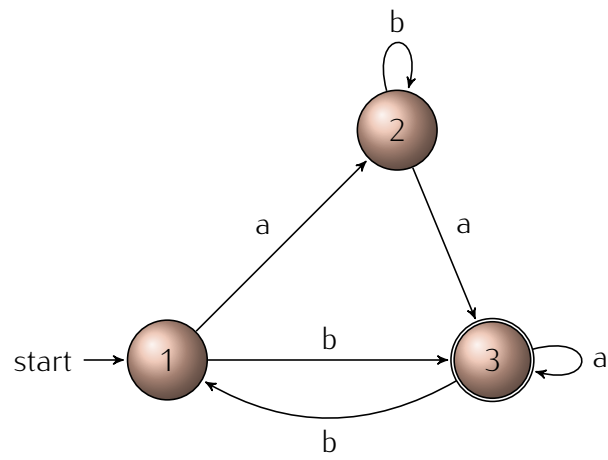


Figure 36: Q09: FA_2

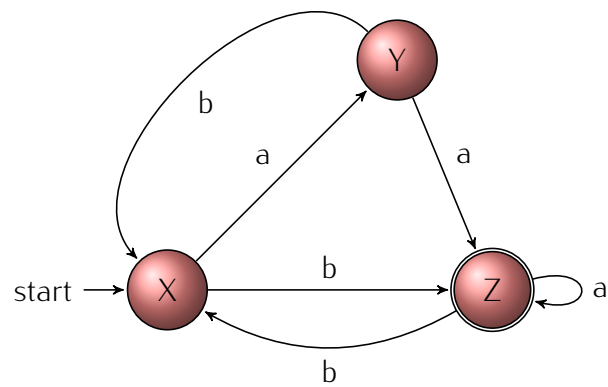
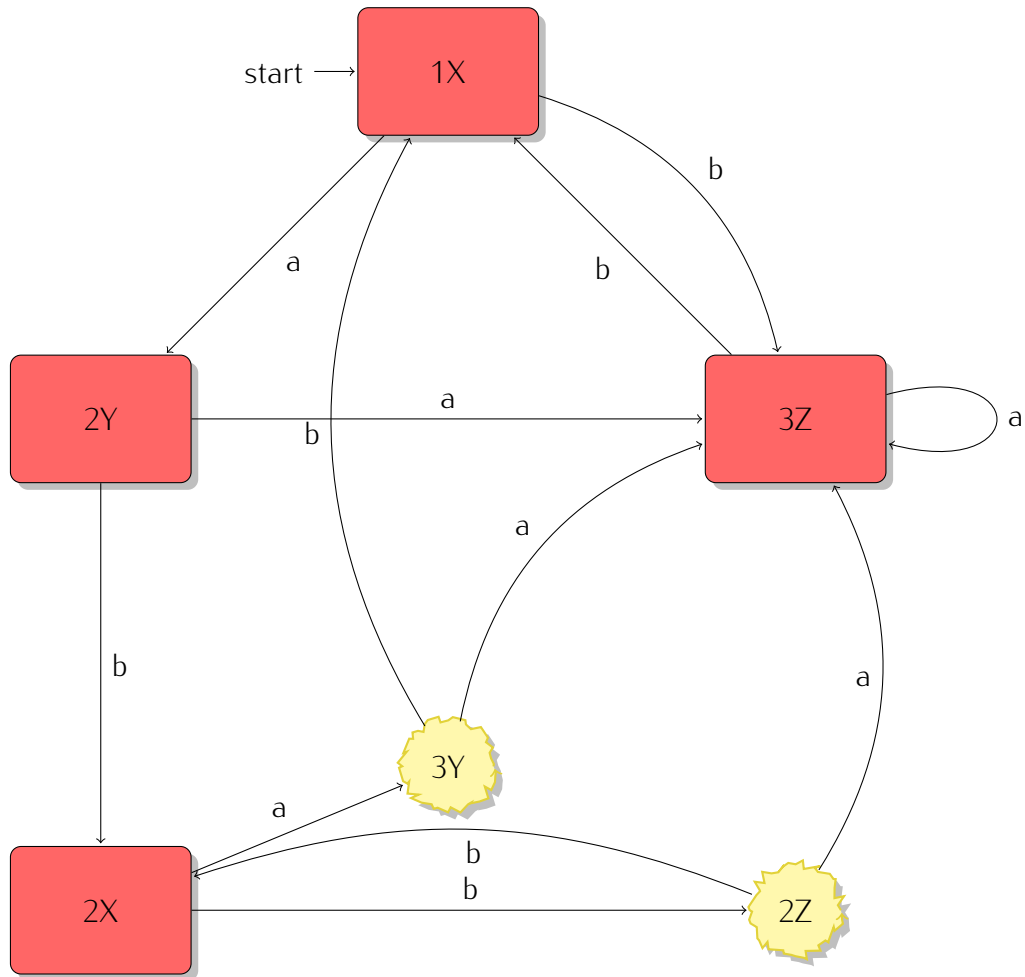


Figure 37: Q09: $L_1 \neq L_2$



Not acceptable by $L_1 \cap L_2$: 1X, 1Y, 2X, 2Y

Acceptable by $L_1 \cap L_2$: 3Z

Acceptable by L_1 only: 3X, 3Y

Acceptable by L_2 only: 1Z, 2Z

Due to 3Y and 2Z: $L_1 \neq L_2$