CS375 WK5

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August 6, 2011

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

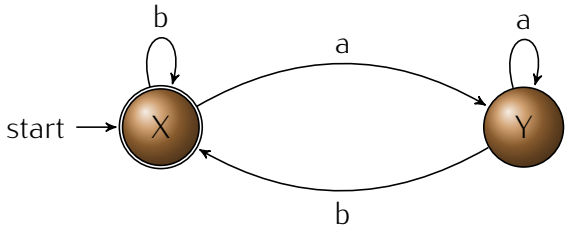


Figure 2: Q01: L_2= b(a+b)*

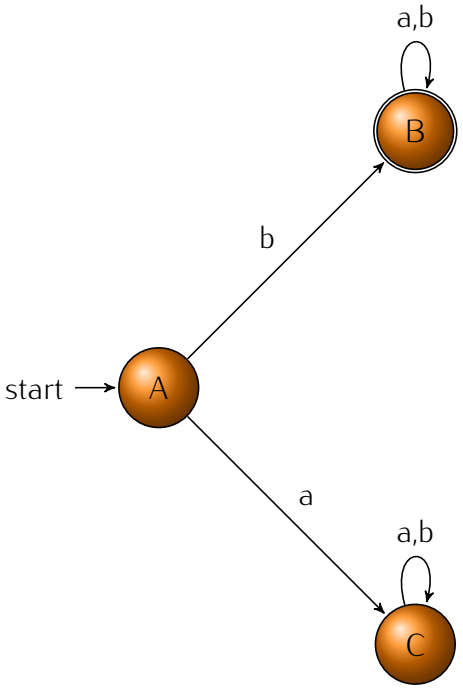


Figure 3: Q01: $L_1 \bigcap L_2$

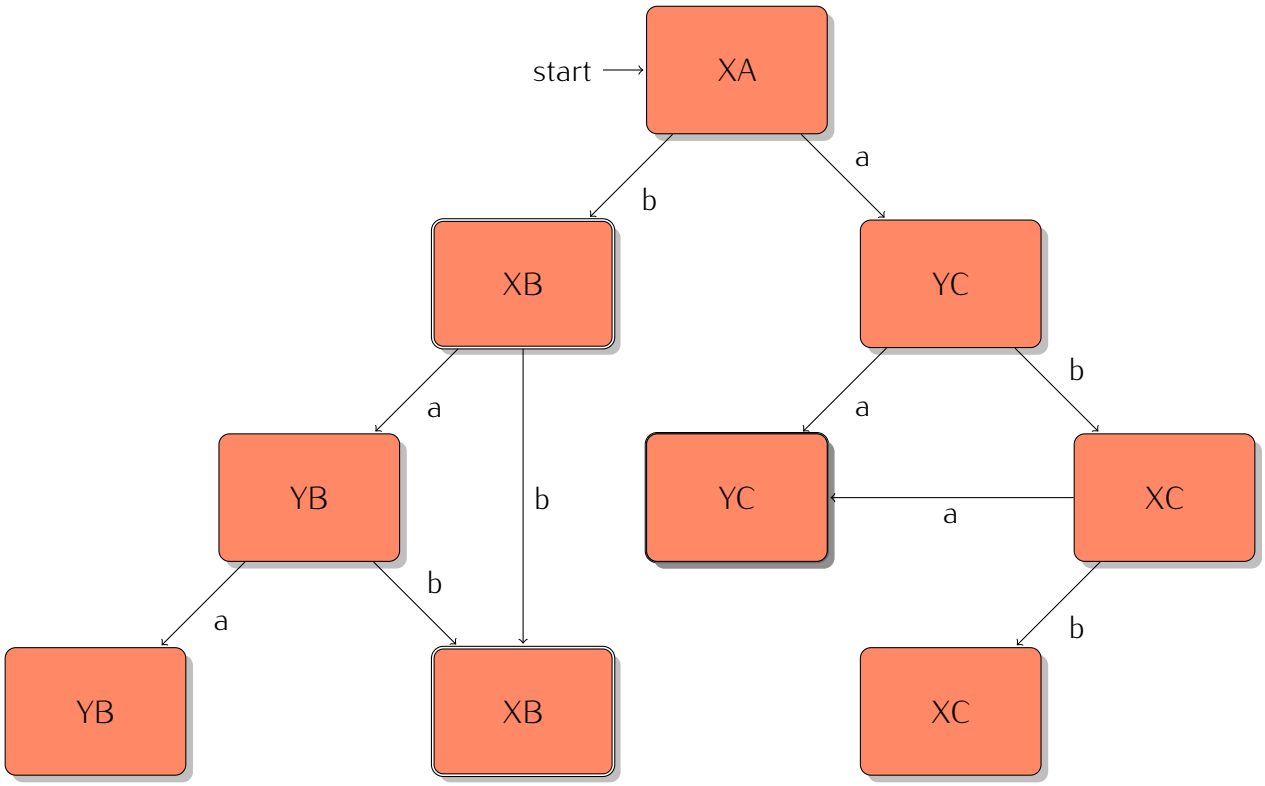


Figure 4: Q01: L_3 = b(b+aa*b)*

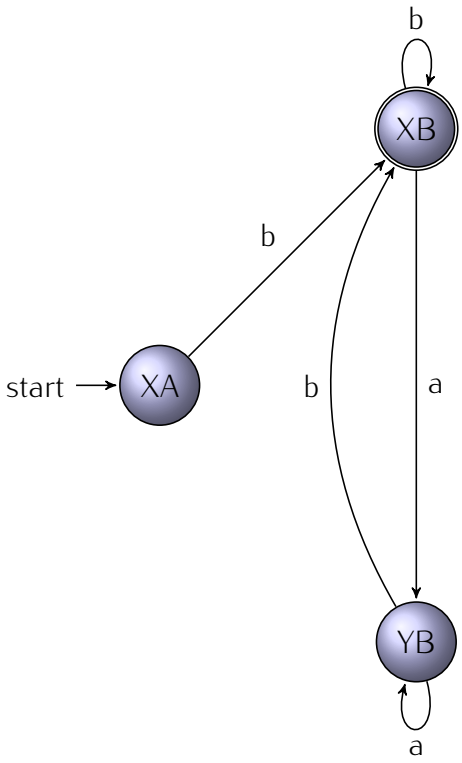


Figure 5: Q02: L_1 = (a+b)b(a+b)*

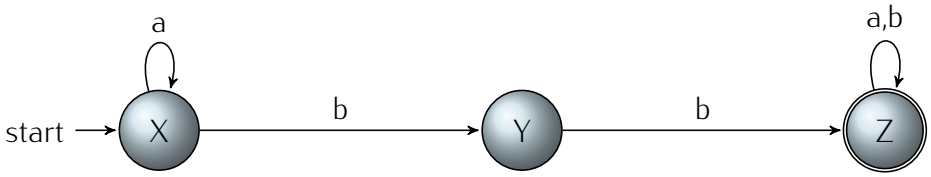


Figure 6: Q02: L_2= b(a+b)*

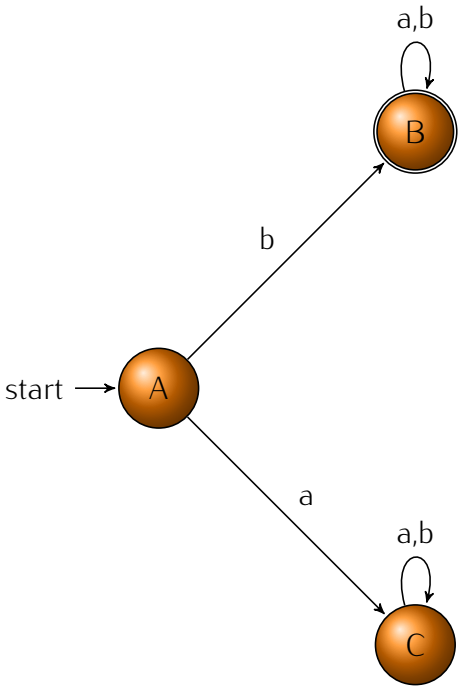


Figure 7: Q02: $L_1 \bigcap L_2$

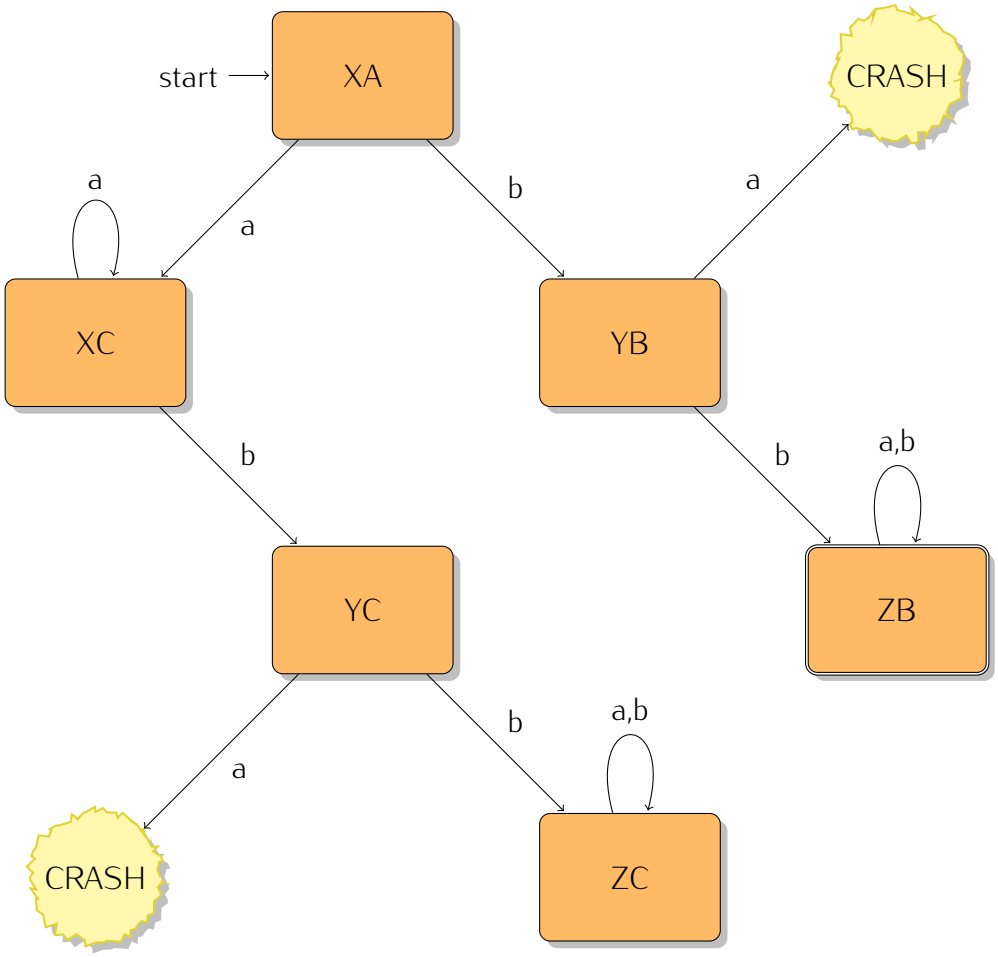


Figure 8: Q02: $L_3 = ab(a+b)^*$

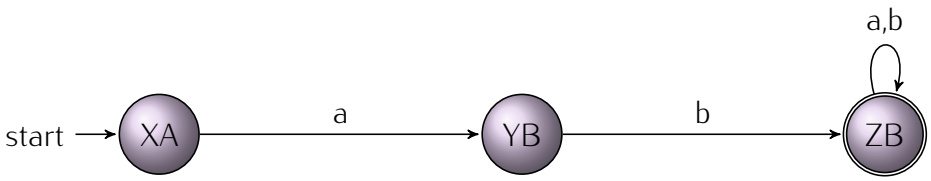


Figure 9: Q03: $L_1 = (b+ab)^*(a+\Lambda)$

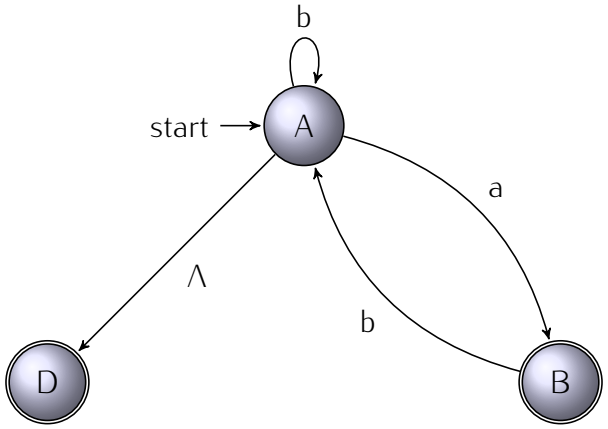


Figure 10: Q03: $L_2 = (a+b)^*aa(a+b)^*$

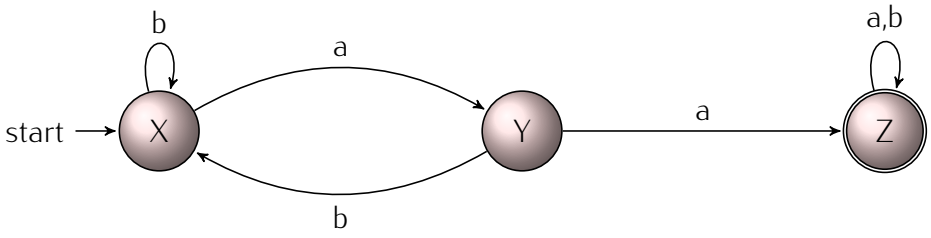


Figure 11: Q02: $L_1 \bigcap L_2$

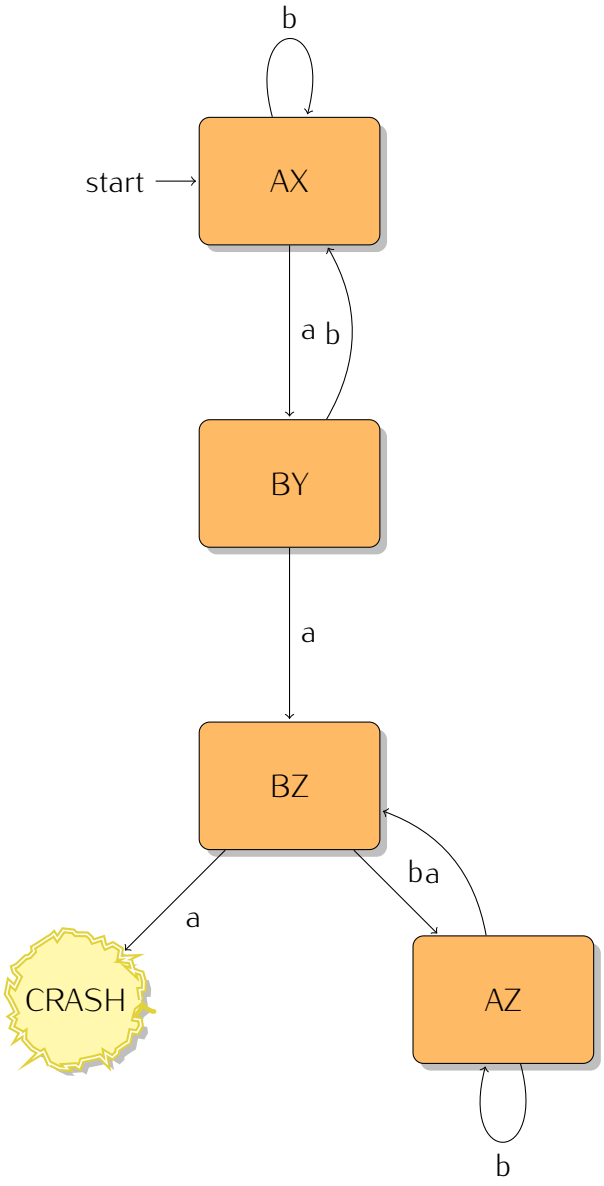


Figure 12: Q03: $L_3 = (b+ab)^*aa(bb^*a)^*$

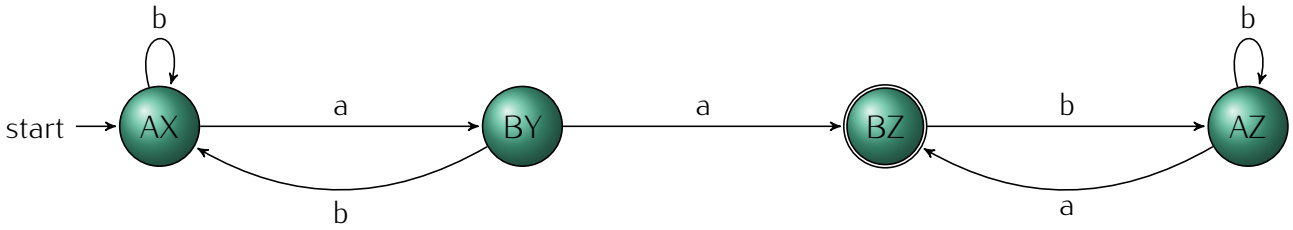


Figure 13: Q04: L_1 = (aa+ab+ba+bb)*

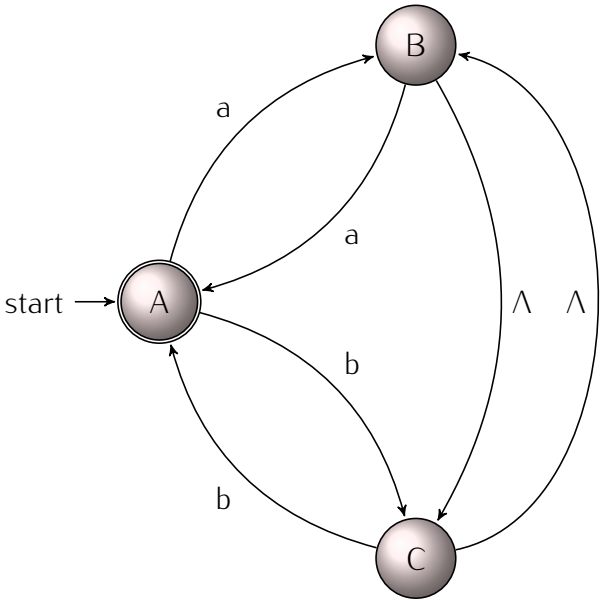


Figure 14: Q04: L_2= b(a+b)*

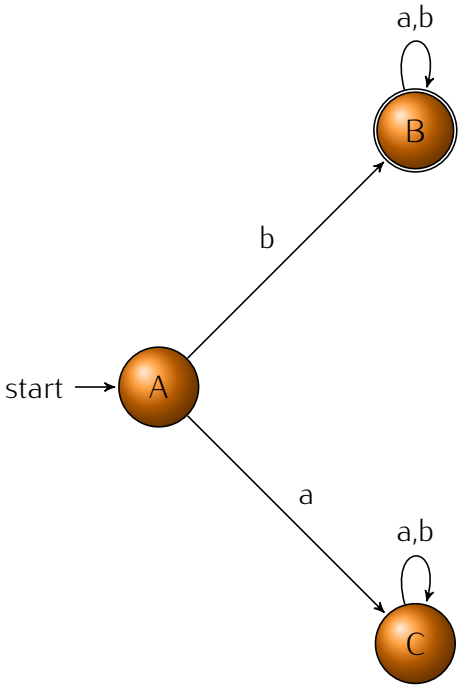


Figure 15: Q04: $L_1 \bigcap L_2$

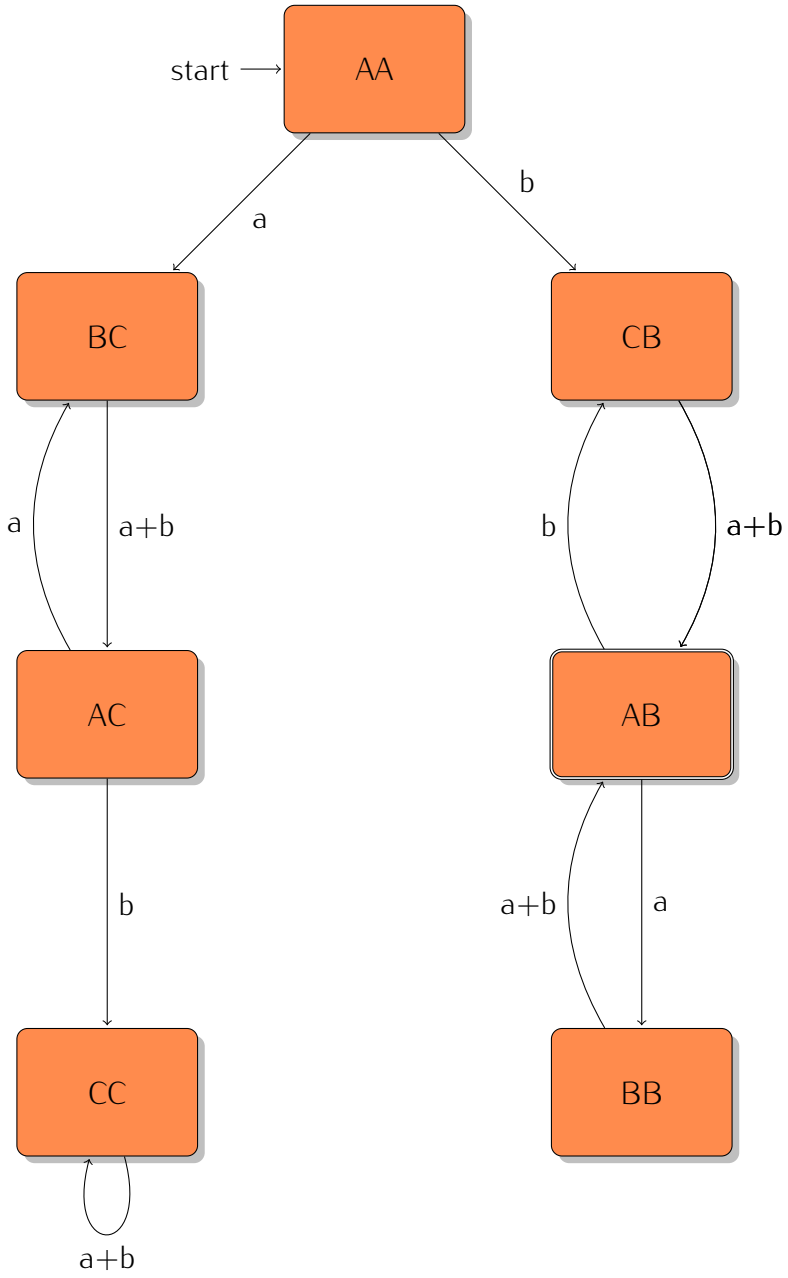


Figure 16: Q04: L_3= b(a+b)(b(a+b)+a(a+b))

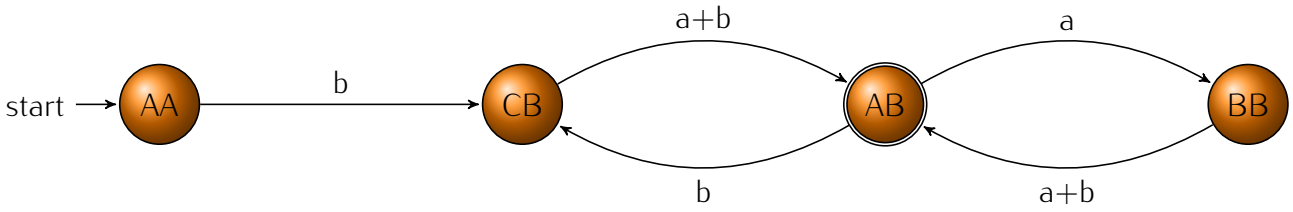


Figure 17: Q05: L_1 = (aaa+bbb)*

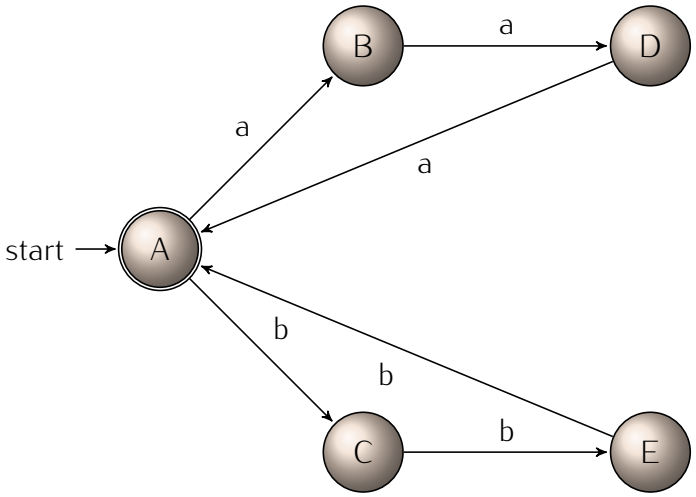


Figure 18: Q05: L_2= a(a+b)*

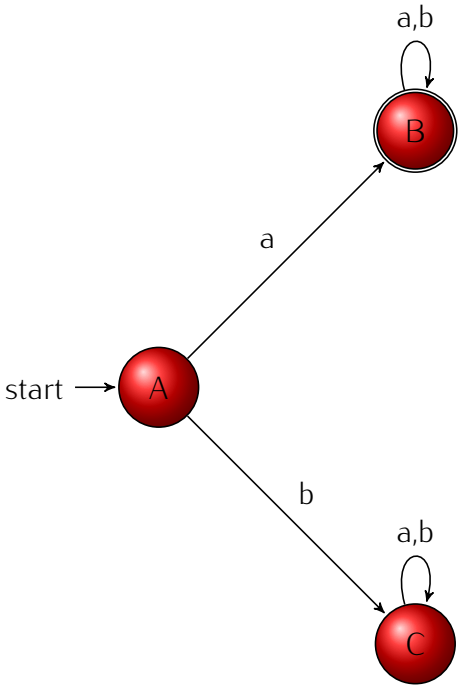


Figure 19: Q05: $L_1 \bigcap L_2$

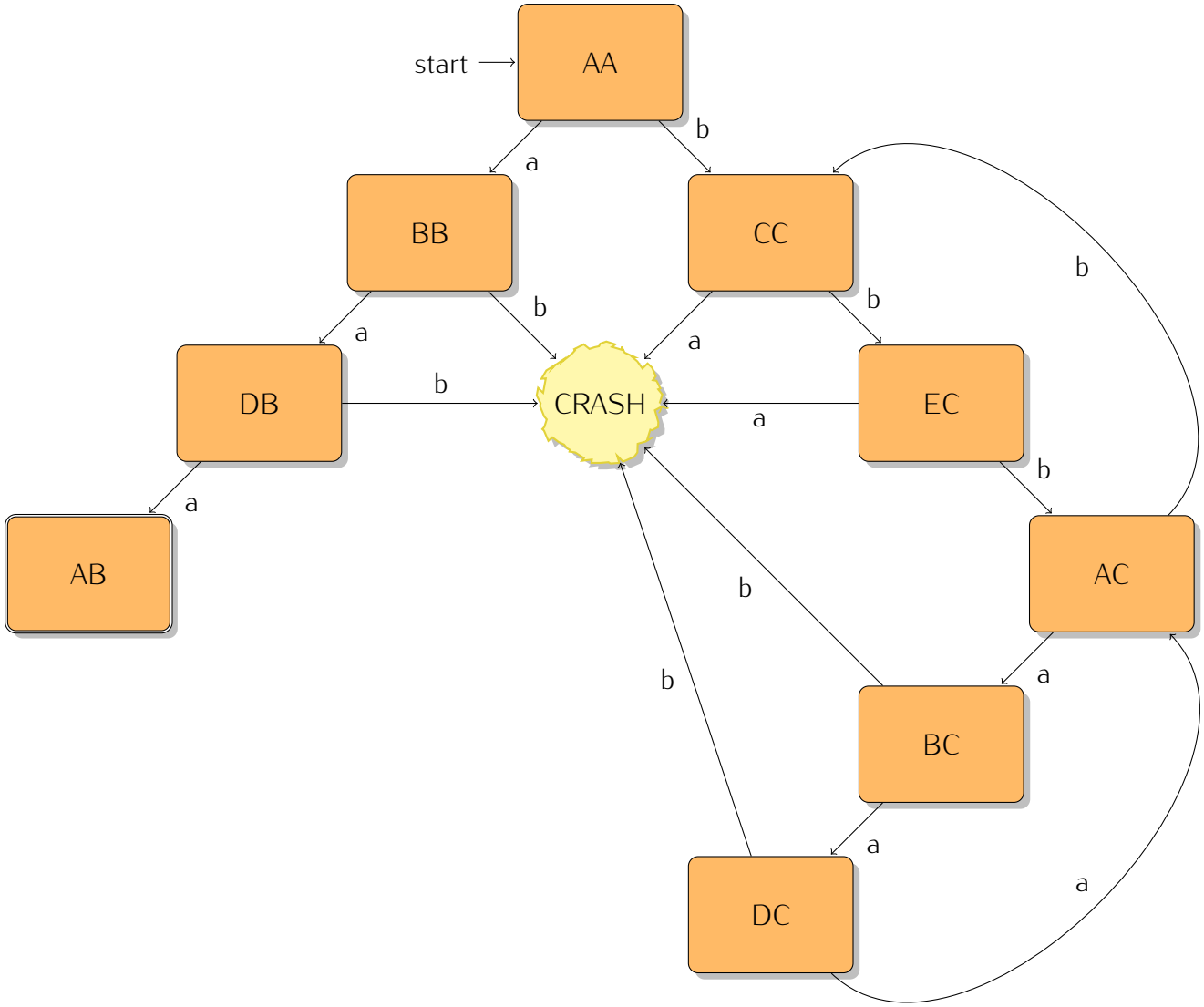


Figure 20: Q05: L_3= aaa

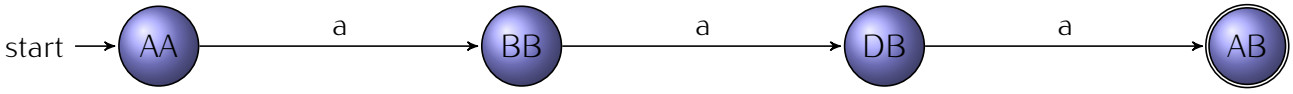


Figure 21: Q06: FA_1

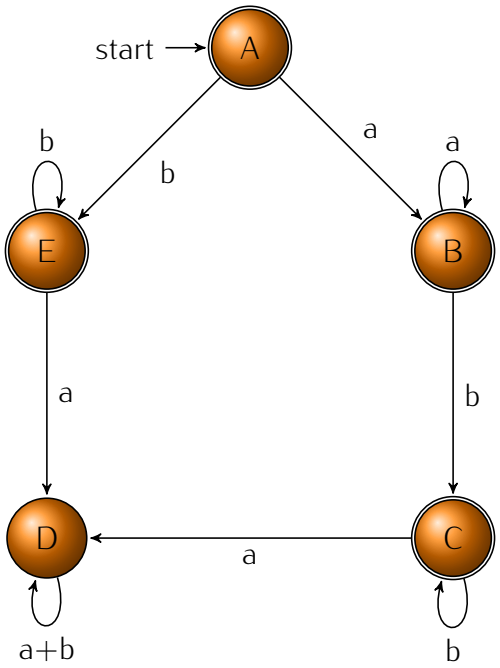


Figure 22: Q06: FA_2

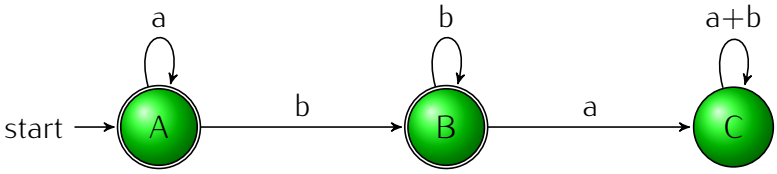
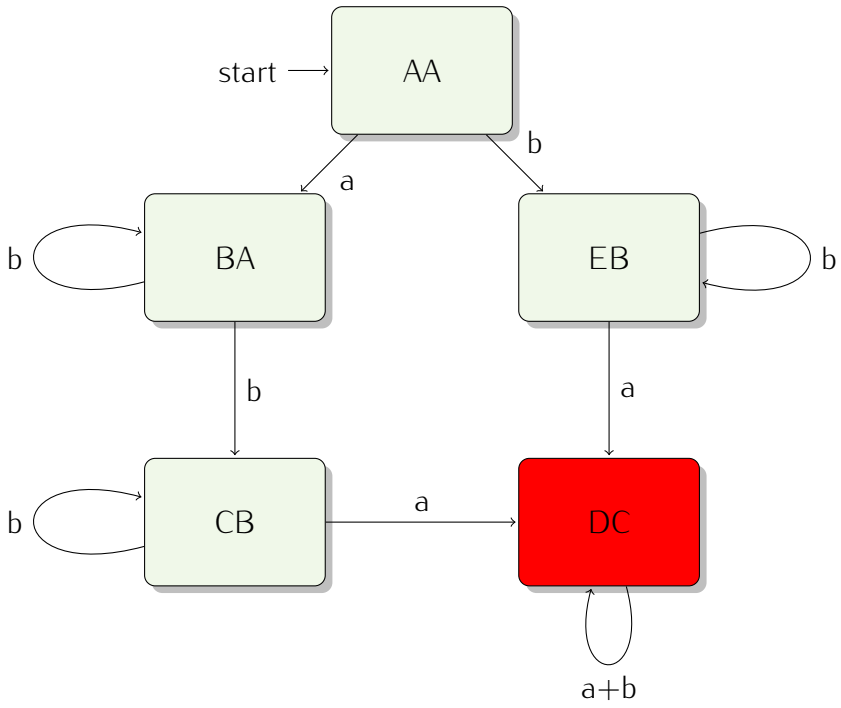


Figure 23: Q06: $L_1 \bigcap L_2$



Not acceptable by $L_1 \bigcap L_2$: DC
Acceptable by $L_1 \bigcap L_2$: AA, BA, CB,EB

Figure 24: Q07: FA_1

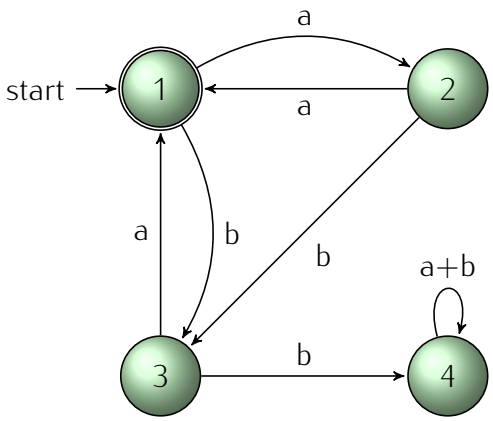
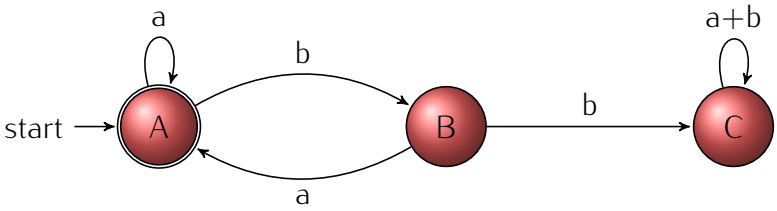


Figure 25: Q07: FA_2



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

Figure 26: Q07: FA'_1

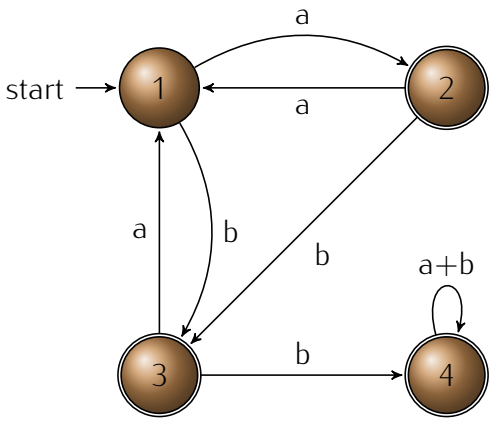


Figure 27: Q07: FA_2

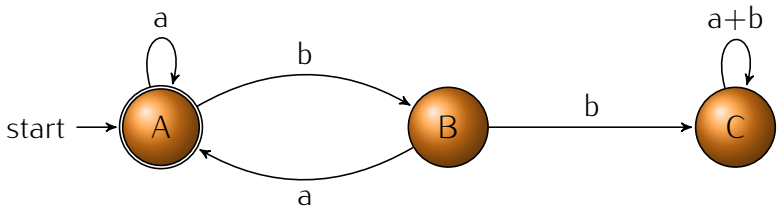


Figure 28: Q07: $(FA'_1 + FA_2)'$ No final states

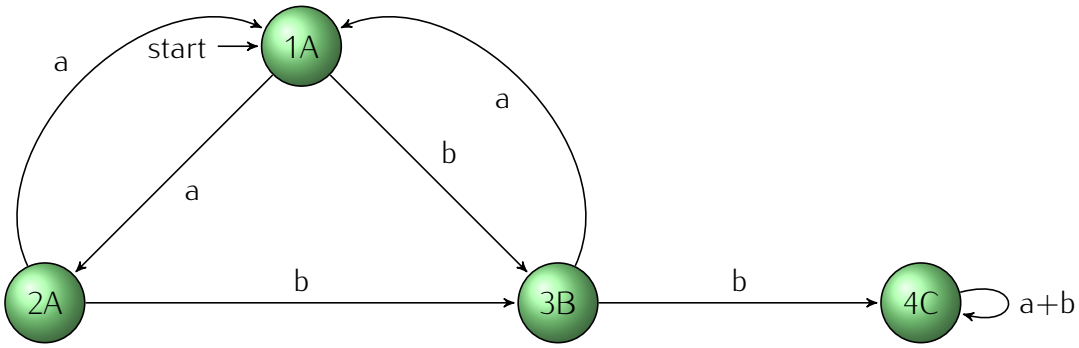


Figure 29: Q07: FA_1

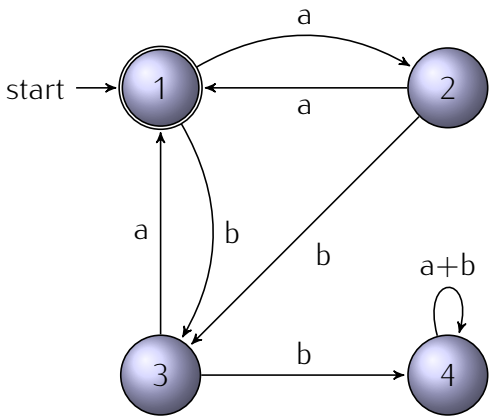


Figure 30: Q07: FA'_2

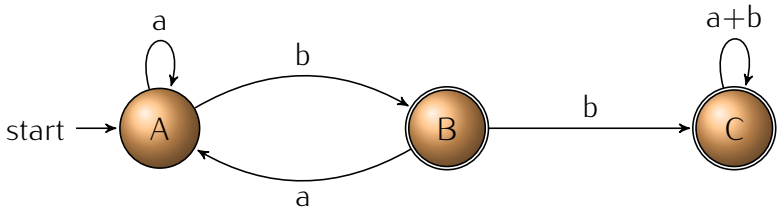


Figure 31: Q07: $(FA_1 + FA'_2)'$ No final states

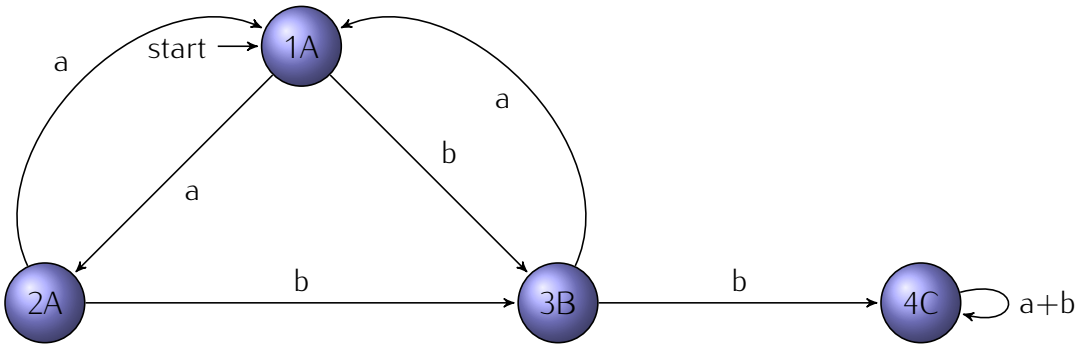


Figure 32: Q08: FA_1

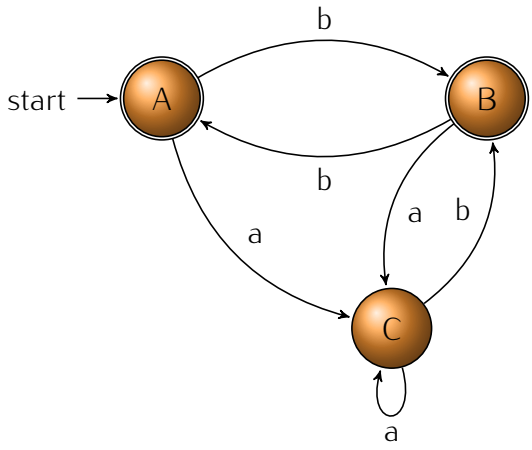


Figure 33: Q08: FA_2

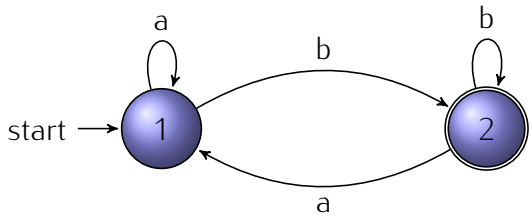
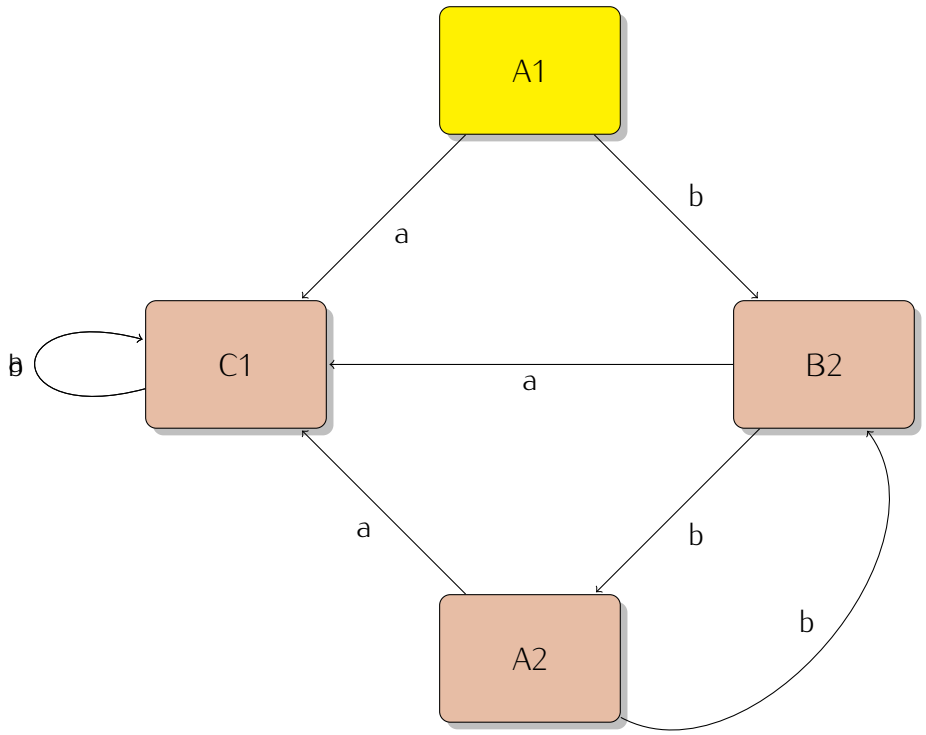


Figure 34: Q08: $L_1 \neq L_2$



Not acceptable by $L_1 \bigcap L_2$: C1
Acceptable by $L_1 \bigcap L_2$: 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

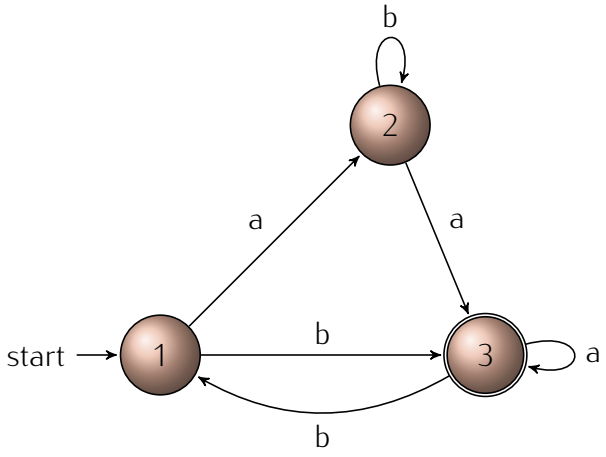


Figure 36: Q09: FA_2

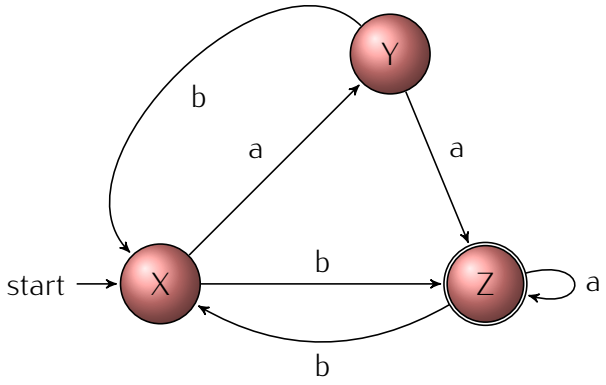
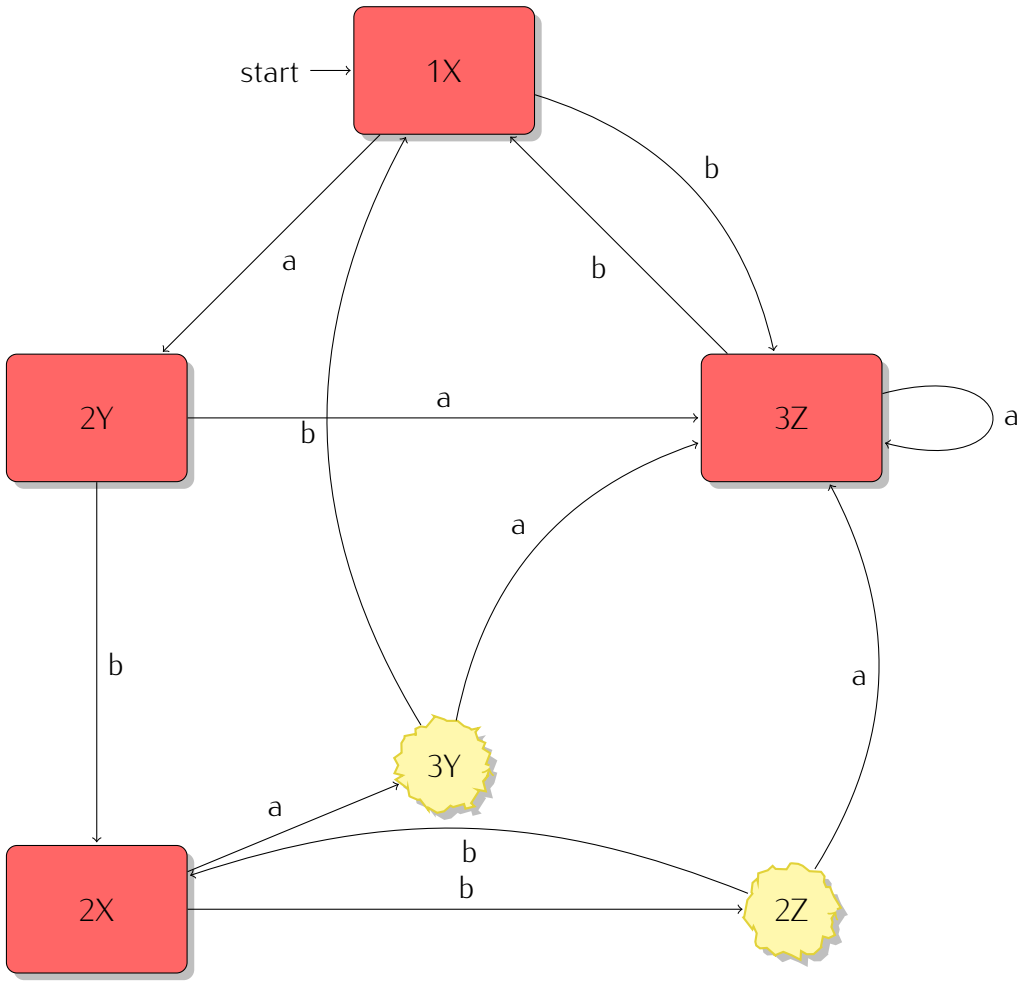


Figure 37: Q09: $L_1 \neq L_2$



Not acceptable by $L_1 \bigcap L_2$: 1X,1Y,2X,2Y
Acceptable by $L_1 \bigcap L_2$: 3Z
Acceptable by L_1 only: 3X, 3Y
Acceptable by L_2 only: 1Z, 2Z
Due to 3Y and 2Z: $L_1 \neq L_2$

Figure 38: Q10: Blue Paint

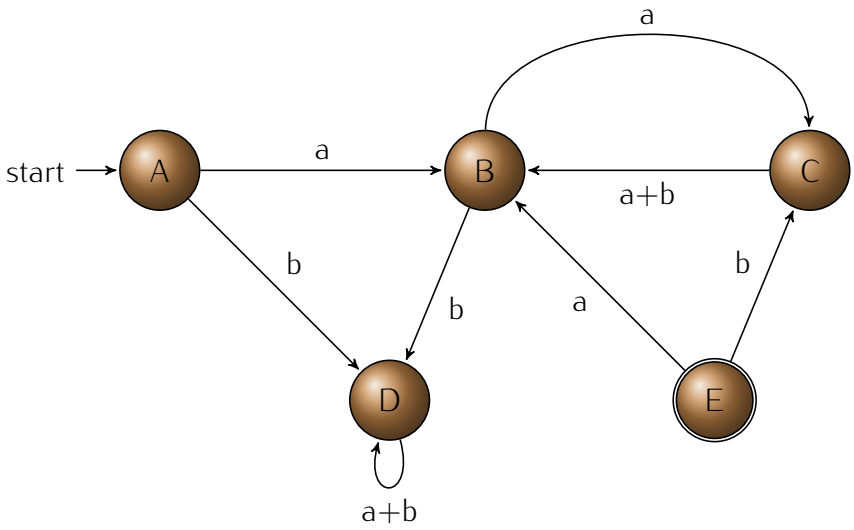


Figure 39: Q10: Step 1

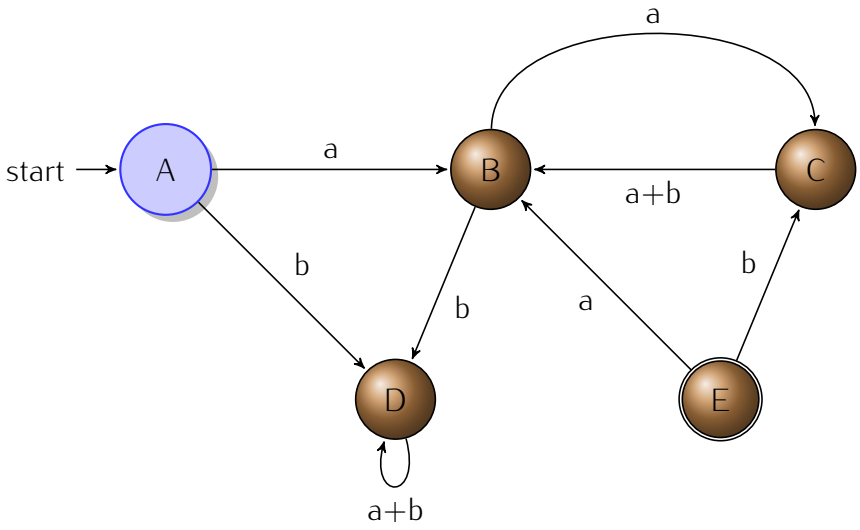


Figure 40: Q10: Step 2

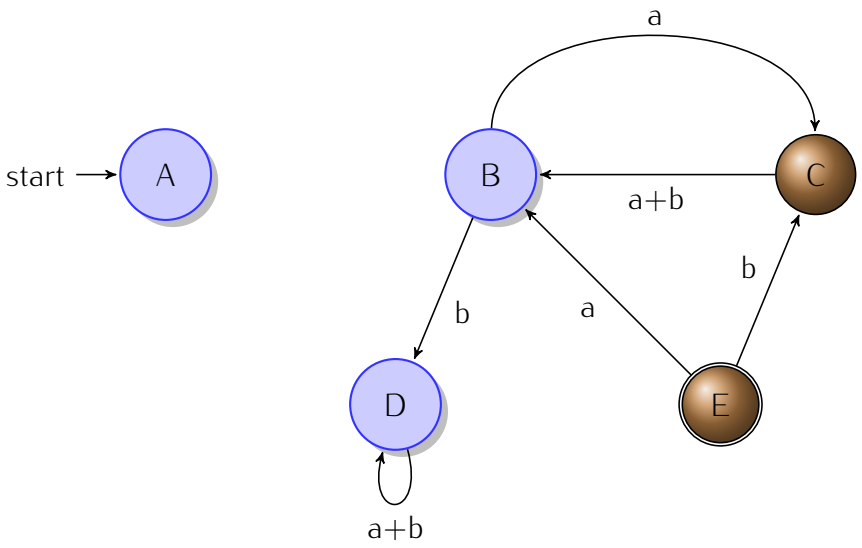


Figure 41: Q10: Step 3

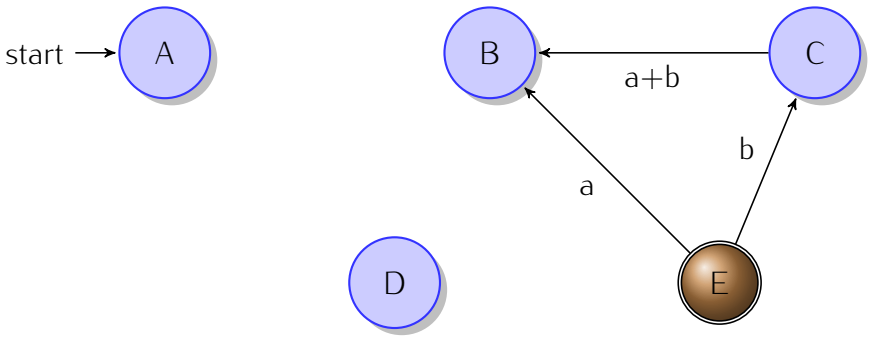
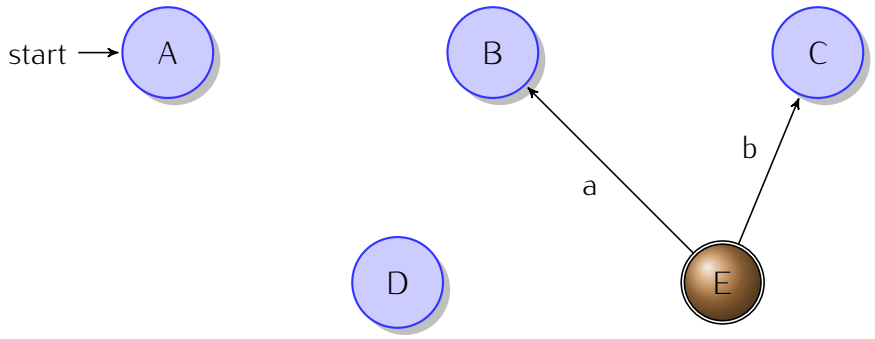


Figure 42: Q10: Step 4



This machine accepts no words due to the fact that node E remains unpainted and is the only final state.

Figure 43: Q11: Blue Paint

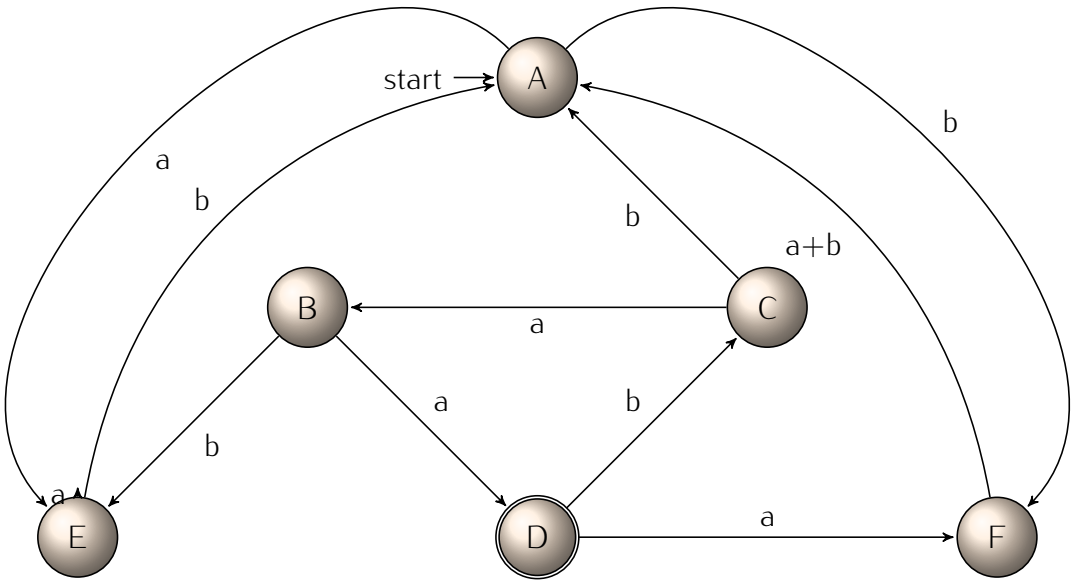


Figure 44: Q11: Step 1

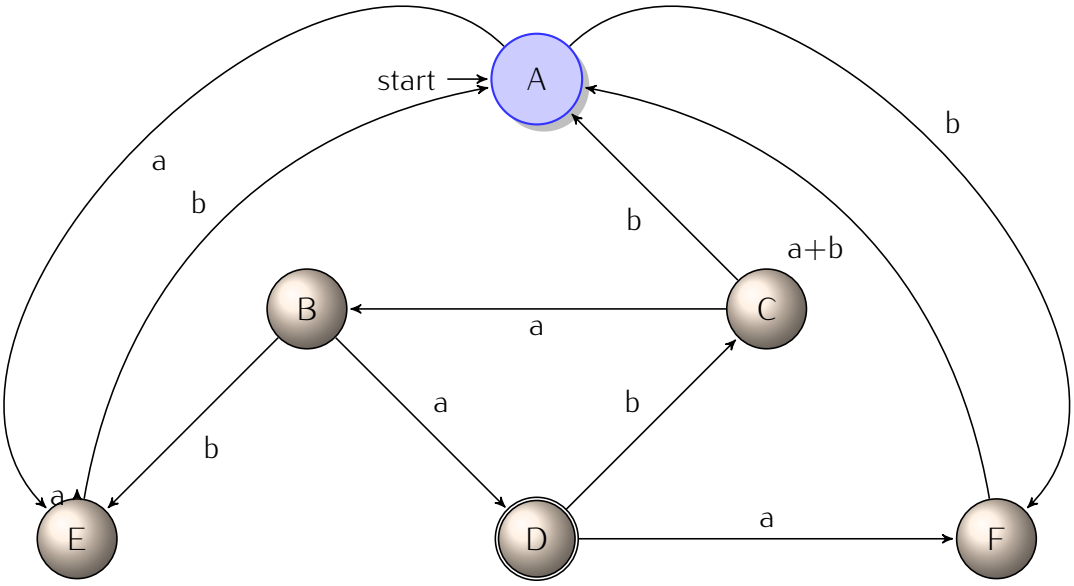


Figure 45: Q11: Step 2

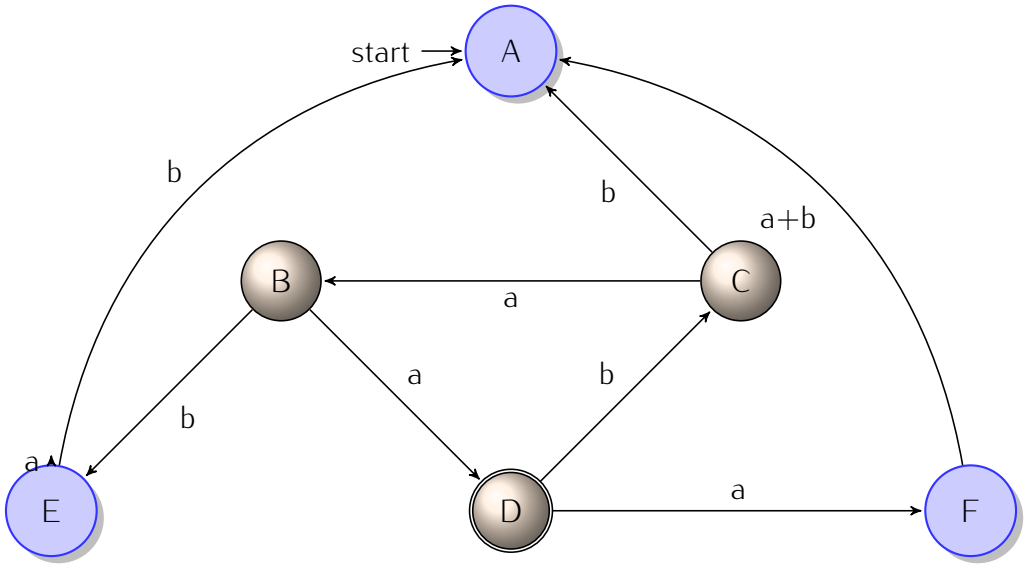
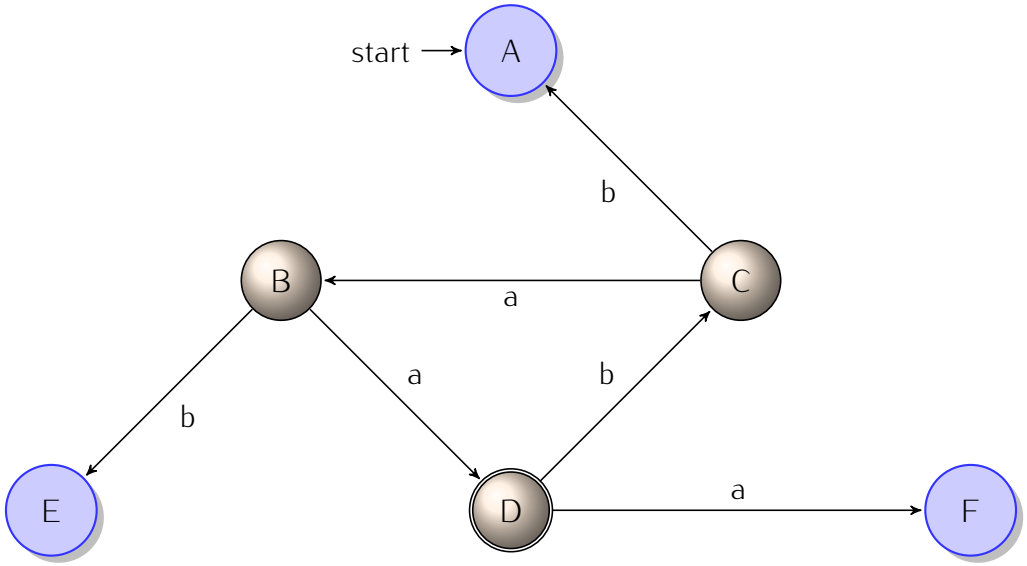


Figure 46: Q11: Step 3



This machine accepts no words due to the fact that node D remains unpainted and is the only final state.