



1) Calculate the semantics of each of the sequence diagrams Ex1, Ex2, Ex3, Ex4, Ex5, Ex6, Ex7

Let

$t1 = \langle !a, ?a, !b, ?b, !c, ?c \rangle$

$t2 = \langle !a, !b, ?a, ?b, !c, ?c \rangle$

$t3 = \langle !a, ?a, !c, ?c \rangle$

$t4 = \langle !a, ?a, !b, ?b, !d, ?d, !c, ?c \rangle$

$t5 = \langle !a, !b, ?a, ?b, !d, ?d, !c, ?c \rangle$

$t6 = \langle !a, ?a, !b, ?b, !d, !c, ?d, ?c \rangle$

$t7 = \langle !a, !b, ?a, ?b, !d, !c, ?d, ?c \rangle$

$t9 = \langle !f, ?f, !g, ?g \rangle$

$t10 = \langle !f, ?f, !h, ?h, !g, ?g \rangle$

$t11 = \langle !f, ?f, !h, !g, ?h, ?g \rangle$



Positive

- Ex1: t1,t2
- Ex2: t3
- Ex3: t1,t2
- Ex4: t9
- Ex5: t9
- Ex6: t1,t2,t9
- Ex7: t1,t2,t9

Negative

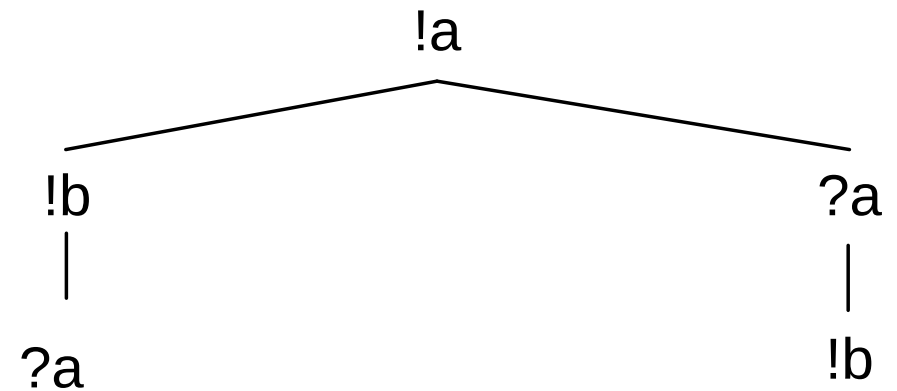
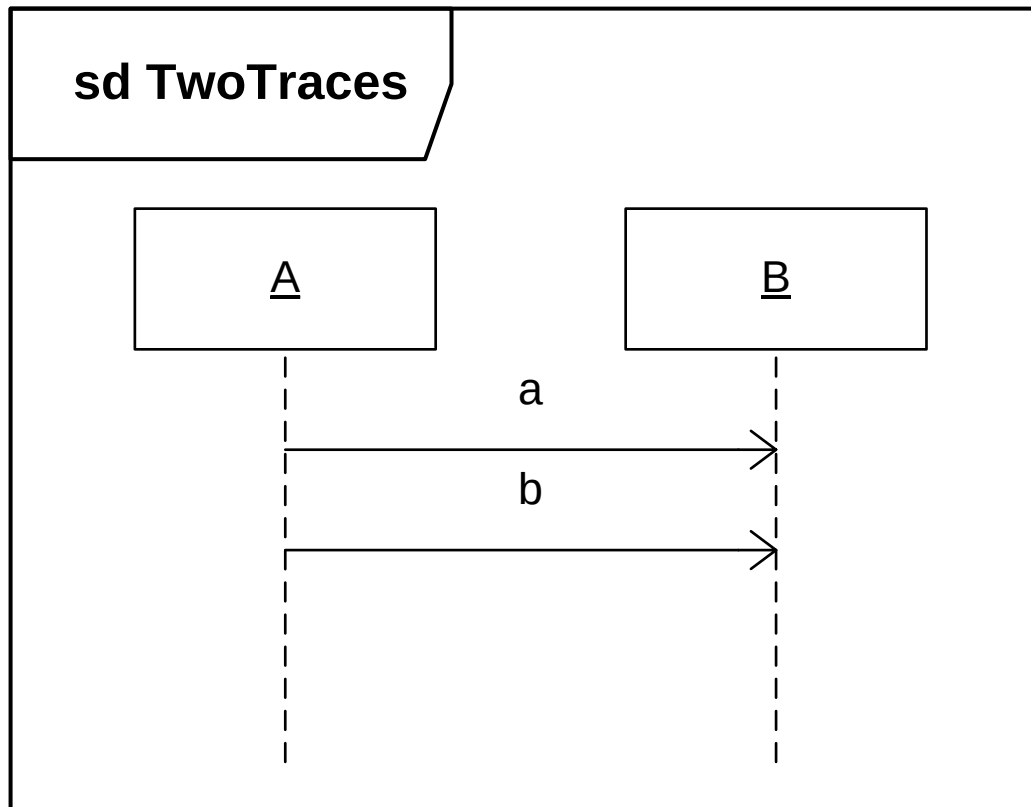
- Ex1: none
- Ex2: t1,t2
- Ex3: t4,t5,t6,t7
- Ex4: none
- Ex5: t10, t11
- Ex6: none
- Ex7: t4,t5,t6,t7,t10,t11



Remember

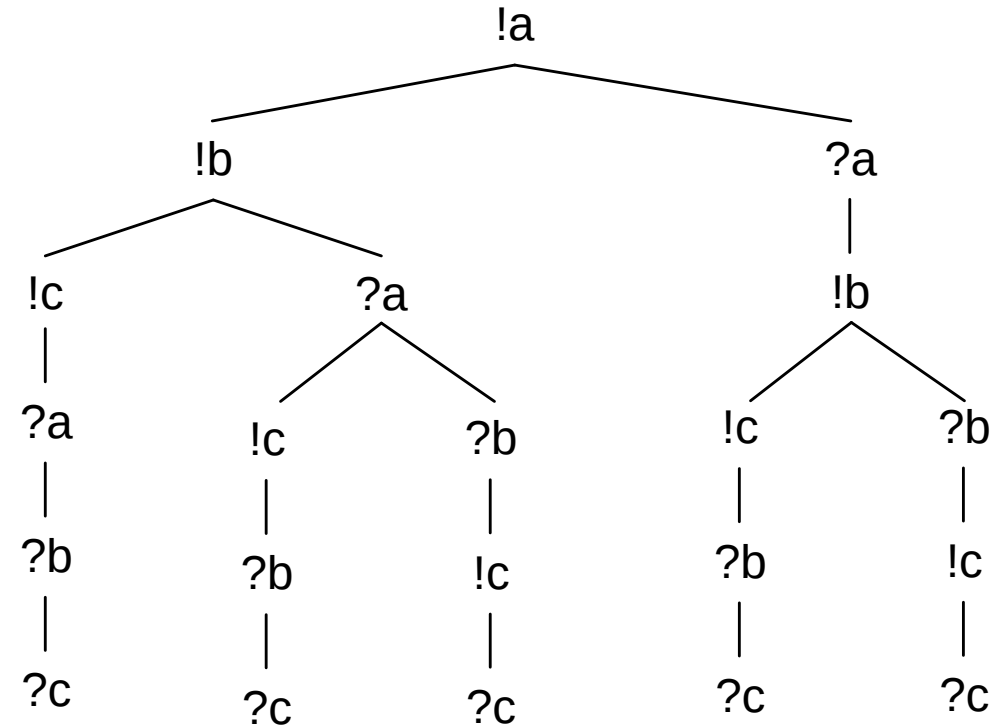
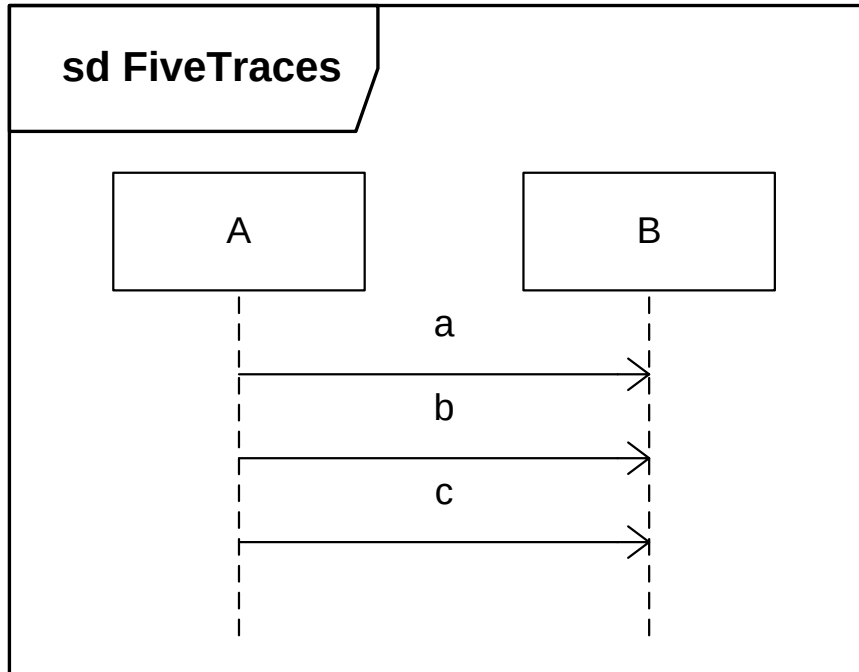
- **Weak sequencing:**

- events from the same lifeline are ordered in the trace in the same order as on the lifeline
- events on different lifelines from different operands may come in any order

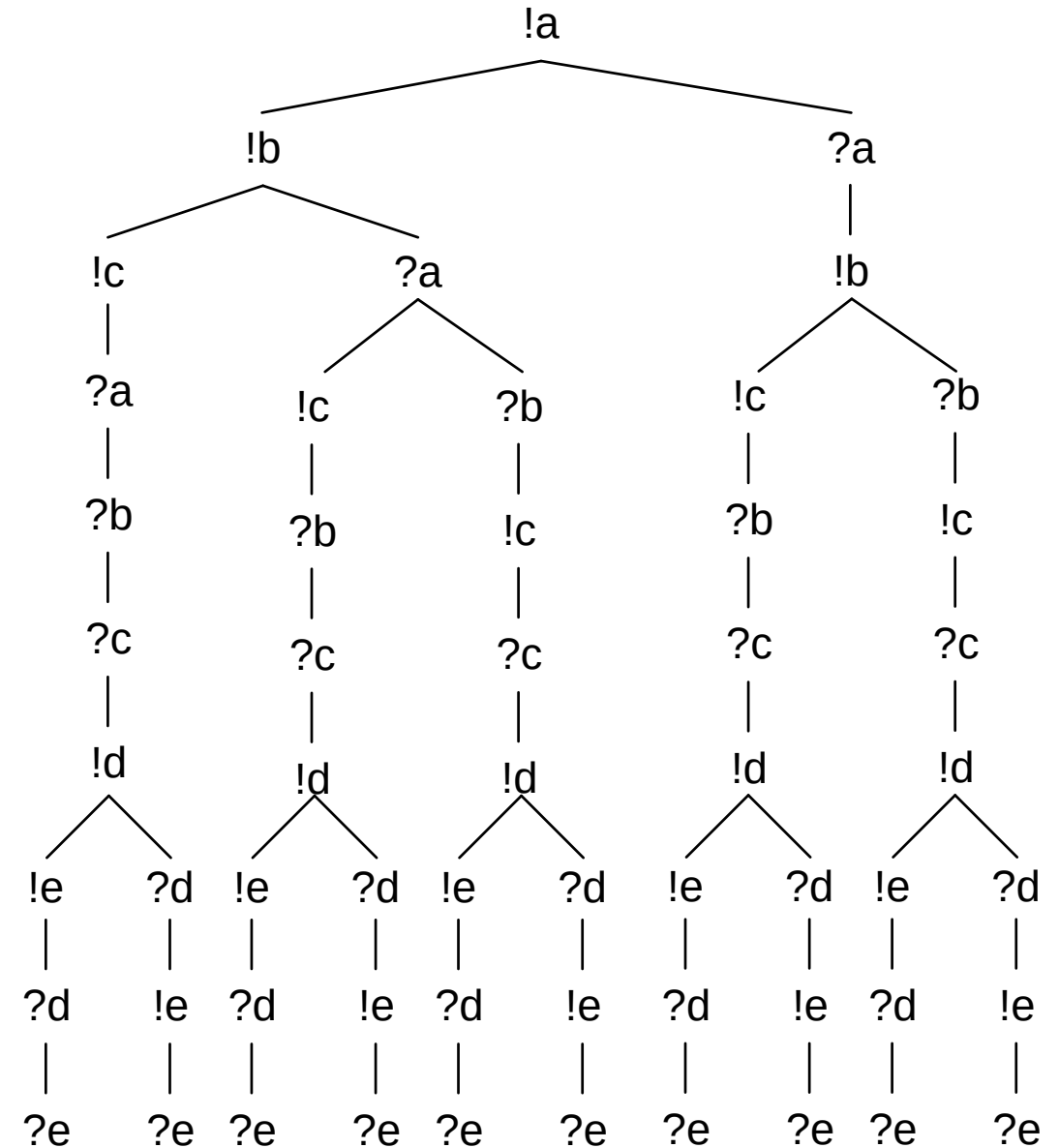




2)



$\langle !a, ?a \rangle \text{seq} \langle !b, ?b \rangle \text{seq} \langle !c, ?c \rangle = \{ \langle !a, !b, !c, ?a, ?b, ?c \rangle, \langle !a, !b, ?a, !c, ?b, ?c \rangle, \langle !a, !b, ?a, ?b, !c, ?c \rangle, \langle !a, ?a, !b, !c, ?b, ?c \rangle, \langle !a, ?a, !b, ?b, !c, ?c \rangle \}$





4)

- **We may repeat the trick from the previous exercise as many times we want. Each time we get twice as many traces as long as we change the transmission direction.**