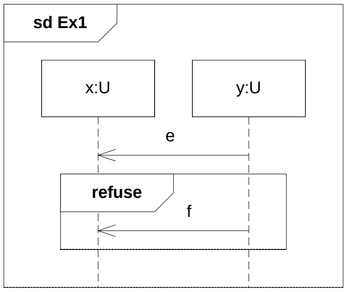
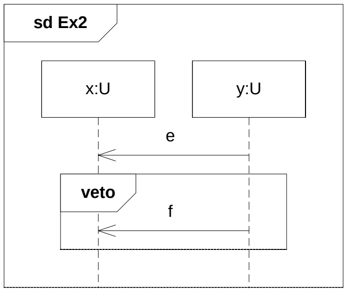
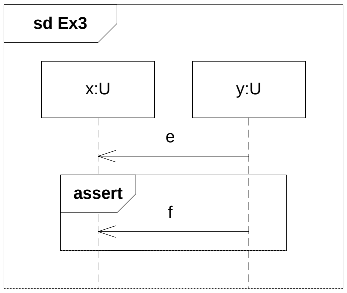
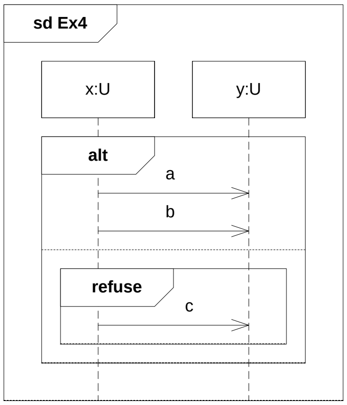
INF5150 Exercises 2008-10-03

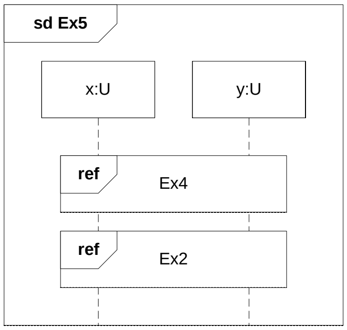
1. Calculate the semantics of each of the diagrams below. For Ex6, let chk(att=7) denote the check-event in a state where x.att=7 and let chk(att≠7) denote the check-event in a state where x.att≠7.

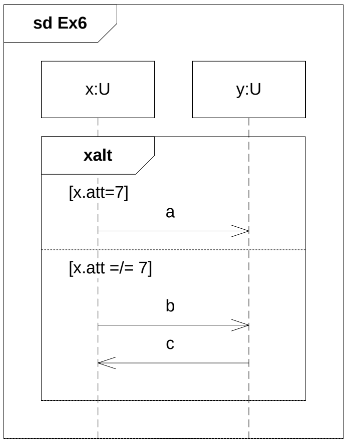












2. Specify a machine Coin that simulates a single coin flip, where the outcomes are represented by messages. The specification should be given as a sequence diagram that shows the outcomes as messages going from the Coin to the user. When refining your specification, should we use general refinement or limited refinement?

3. Specify a vending machine that fulfills the criteria given below without using the assert operator. The specification should be given as a sequence diagram called VendingMachine that shows the interaction between the vending machine and a user.

- The machine should offer at least both coffee and tea, depending on input from the user. But we want to leave open the possibility that the final implementation also offer other drinks.
- Money should be inserted before the user chooses the type of drink.
- The price of both coffee and tea is 10 kr. The final implementation must be able to accept at least one of the following alternatives: one 10 kr coin or two 5 kr

coins. It is sufficient to offer one of these possibilities – your specification should leave the choice to those responsible for implementing or further refining the specification.

- Make sure that neither tea nor coffee is delivered unless 10 kr has been paid.
- Make sure that tea is not delivered if coffee has been chosen, and vice versa.

When refining your specification, should we use general refinement or limited refinement?

4. The vending machine from question 3 consists of a paymentHandler and a drinkPreparator. Let E be the empty set (of abstract events). Define a mapping L from concrete to abstract lifelines and make a sequence diagram VendingMachine’ (which includes lifelines for paymentHandler and drinkPreparator) such that VendingMachine $\rightsquigarrow_{c}^{L,E}$ VendingMachine’. In other words, VendingMachine’ should be a detailing of VendingMachine w.r.t. L and E.