Voluntary Exam 3

Model Driven Software Development (MDSD)

Day: Dec 9, 2014   TIME: 14:20-14:40   Place:HA1

Responsible: Rogardt Heldal

Result: In the end of the course in collaboration with the oral examination on the project

Extra aids: None

Grade intervals: Each voluntary exam gives a maximum of 20 points. There will be 3 voluntary exams. The sum of the two best results will give the grade:

- U: 0 – 15p, 3: 16-23p, 4: 24-31p, 5: 32-40p

- G: 16-31 p, VG: 32-40p

Please observe the following:

- Write clearly. Unreadable = wrong

- Incorrect answers result in point deduction. However, you can not get less than zero points in one question.

- Fewer points are given for unnecessarily complicated solutions

- Indicate clearly if you make assumptions that are not given in the assignment

- Write your name, social security number and the project group number below:

NAME:

SOCIAL SECURITY NUMBER:

PROJECT GROUP NUMBER:

Question 1 (3P)

Which of the following seven syntax elements are used in Figure 1?
(Multiple choices possible)

✗ Lifeline

✗ Synchronous message

✗ Object creation

☐ Object destruction

☐ Alternative Fragment
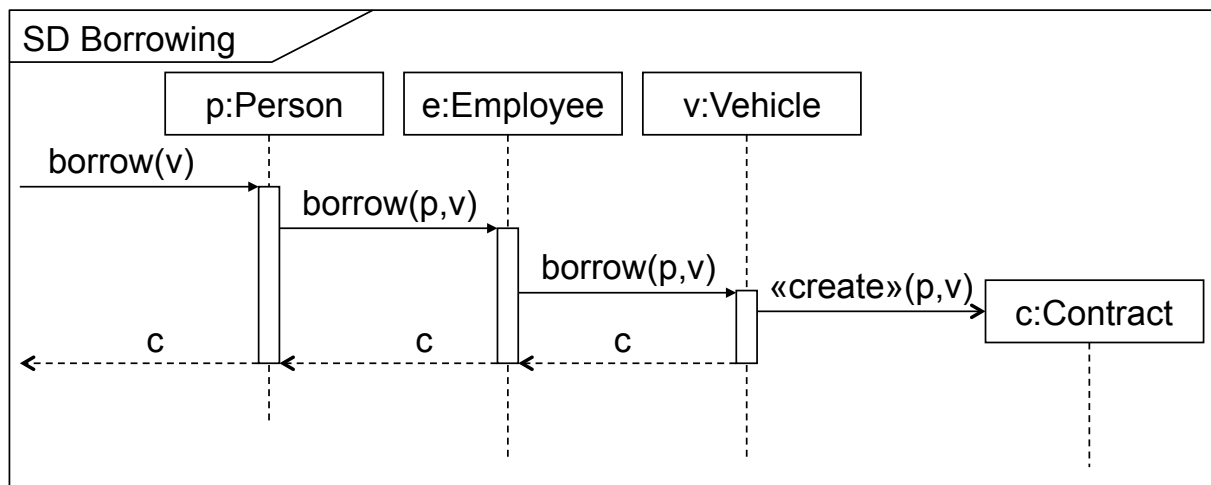
☐ Constraint

Figure 1: SD Borrowing

Question 2 (3P)

Which of the following statements corresponds to the Sequence Diagram depicted in Figure 2?
(Multiple choices possible)

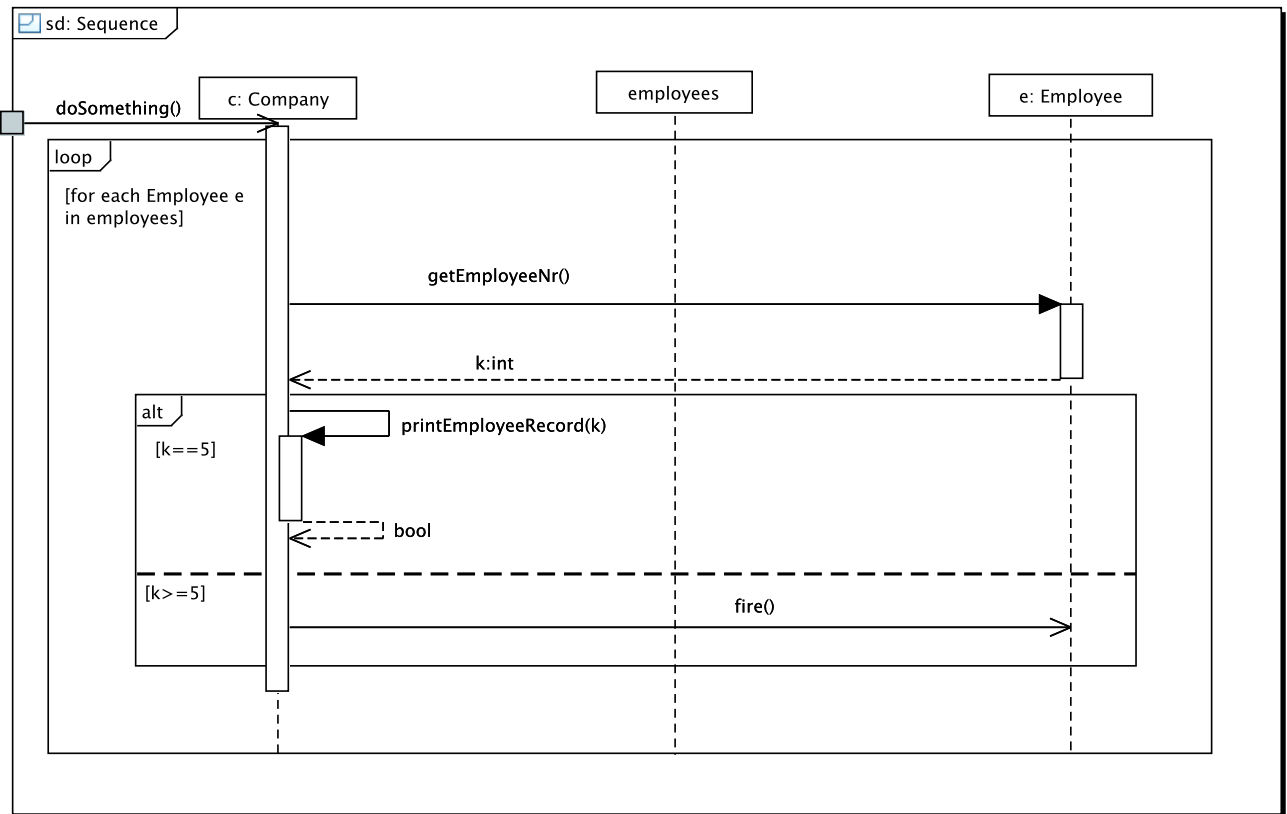| Corresponds to Diagram	Statement
✗	Each Employee in "employees" that has an employee number larger 5 is fired.
✗	The employee with number 5 is not fired.
	For employee with number 5, the message "printEmployeeRecord" is sent to the current employee object.
✗	The sequence diagram uses both asynchronous and synchronous communication.

Figure 2: Sample Sequence

Question 3 (2P)

Decide **for each** statement whether it is correct or incorrect with respect to UML Sequence Diagrams.

Correct	Incorrect	Statement
✗		For the loop fragment, you can specify the minimum iterations, maximum iterations, and a condition.
	✗	Other sequence diagrams can be referenced using the opt fragment.
✗		A sequence diagram describes an interaction.
	✗	When a create message is sent to an object in a sequence diagram, you also have to specify the delete message in the same diagram.

Question 4 (1P)

Which of the following options describes the syntax element depicted in Figure 3 **most accurately**?

(Single choice only)

    O   A pseudo-state that marks the ending of the current sub state machine.

    O   A pseudo-state that remembers the last sub-state the state machine was in, at the same level as the pseudo-state.

    ✗   A pseudo-state that remembers the last sub-state the state machine was in, at the same level or lower as the pseudo-state.

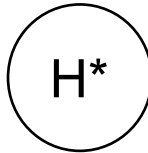   O   An internal state transition marking the display of help information.

Figure 3: Element 1

Question 5 (1P)

Which of the following options describes the syntax element depicted in Figure 4 **most accurately**?
(Single choice only)

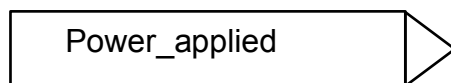|			
O	Call Event	O	Branch
O	Time Event	O	Signal Receive
O	Change Event	O	Guard Condition
✗	Signal Send		

Figure 4: Element 2

Question 6 (1P)

Which of the following options describes the (bold black) element depicted in Figure 5 **most accurately**?
(Single choice only)

O	Call Event	O	Signal Send
O	Time Event	O	Signal Receive
O	Change Event	✗	Guard Condition

[extended]

Figure 5: Element 3

Question 7 (3P)

Which of the following statements apply to the state machine diagram depicted in Figure 6?
(Multiple choices possible)

| Applies to Diagram	Statement
✗	A patient has to be accepted in order to be under treatment.
	The Final State can only be reached, if the State "Actual Surgery" has been reached.
✗	Given that the treatment is interrupted when it is currently in the state "Actual Surgery": Once the treatment is resumed, it resumes to state "Anesthesia".
	Given that the treatment is interrupted when it is currently in the state "Actual Surgery": Once the treatment is resumed, it resumes to state "Actual Surgery".
	Given that the treatment is interrupted when it is currently in the state "Actual Surgery": Once the treatment is resumed, it resumes to state "Pre Treatment".
✗	The Final State can only be reached, if the States "Accepted", "Pre Treatment", "Surgery", and "Post Treatment" have all been visited.
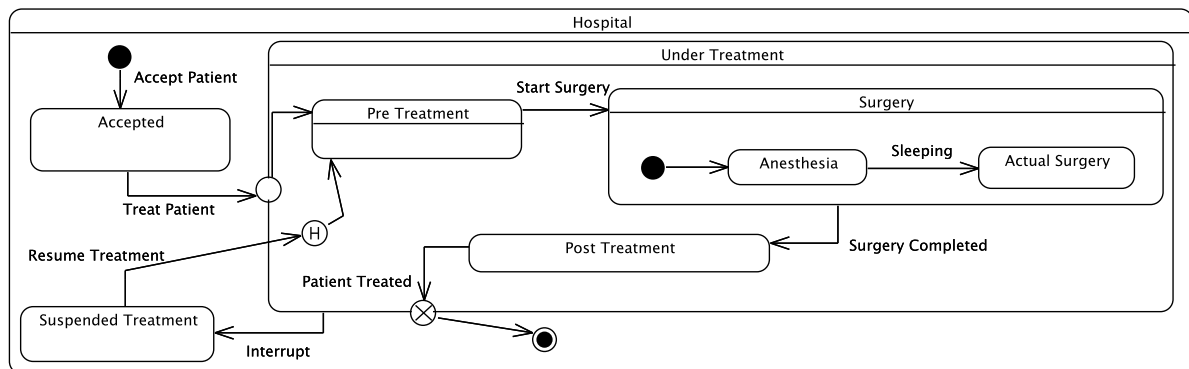
Figure 6: State Machine

Question 8 (2P)

Decide for each statement whether it is correct or incorrect with respect to UML State Machines.

Correct	Incorrect	Statement
✗		"Cyclic" and "Born-and-die" are typical patterns that describe the lifecycle of a UML State Machine.
✗		The entry action of a state is executed immediately when the state is entered and is uninterruptible.
✗		The do activity of a state is interruptible.
✗		There are four types of events in UML State Machines: Call, signal, time, and change events.

Question 9 (2P)

Decide for each statement whether it is correct or incorrect with respect to Modal Sequence Diagrams (MSDs).

Correct	Incorrect	Statement
	✗	When a cold condition is evaluated to false, a safety violation occurs.
✗		The cut denotes the position in which an active MSD resides.

Question 10 (2P)

Decide for each statement whether it is correct or incorrect with respect to Timed Automata (TAs).

Correct	Incorrect	Statement
✗		A transition can only be taken if it is enabled.
	✗	Multiple timed automata can be synchronized via variable assignments.