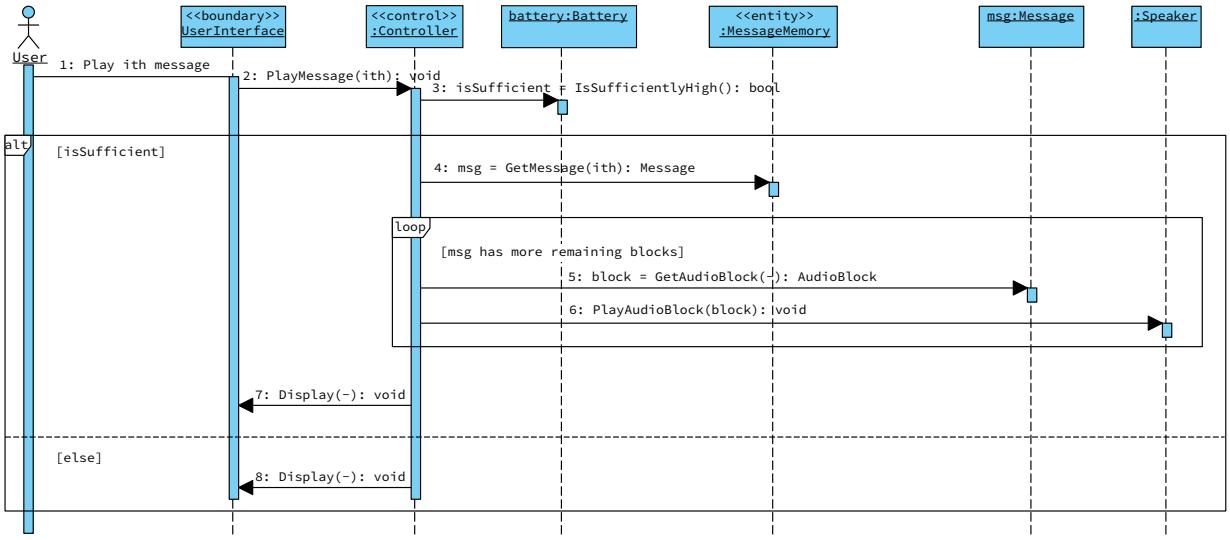
Assignment 3

Exercise 1

You are given a class diagram for the *Dictaphone* system on page 2.

1. Read the sequence diagram below and write down pseudo-code for method `PlayMessage`.



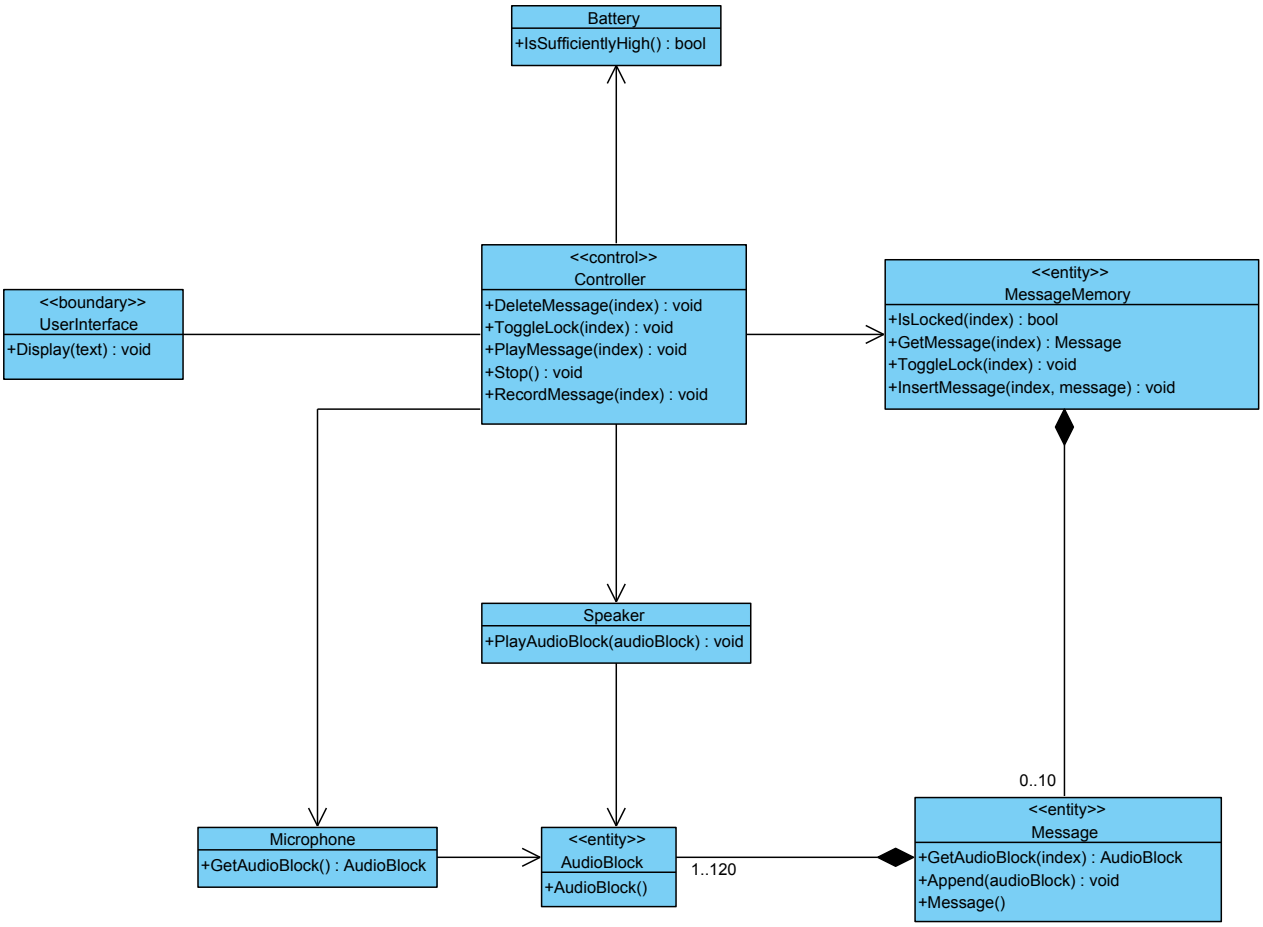
2. Write down a sequence diagram for the following use cases:

- Use case 1: Delete message

User	System
1. User asks the system to delete the i-th message.	2. The system checks if the system is locked (extension point). 3. Message is not locked, it deletes the message and notifies the user.

- Use case 2: Fail to delete message (extends use case 1)

User	System
	3. Message is locked and the system displays an error to the user.


Battery
+IsSufficientlyHigh() : bool
<<control>>
Controller
+DeleteMessage(index) : void
+ToggleLock(index) : void
+PlayMessage(index) : void
+Stop() : void
+RecordMessage(index) : void
<<boundary>>
UserInterface
+Display(text) : void
<<entity>>
MessageMemory
+IsLocked(index) : bool
+GetMessage(index) : Message
+ToggleLock(index) : void
+InsertMessage(index, message) : void
Speaker
+PlayAudioBlock(audioBlock) : void
Microphone
+GetAudioBlock() : AudioBlock
<<entity>>
AudioBlock
+AudioBlock()
1..120
0..10
<<entity>>
Message
+GetAudioBlock(index) : AudioBlock
+Append(audioBlock) : void
+Message()

Exercise 2

Create an Alloy model for the system described below:

(a) there are undergraduate students and graduate students, no student is both undergraduate and graduate student;

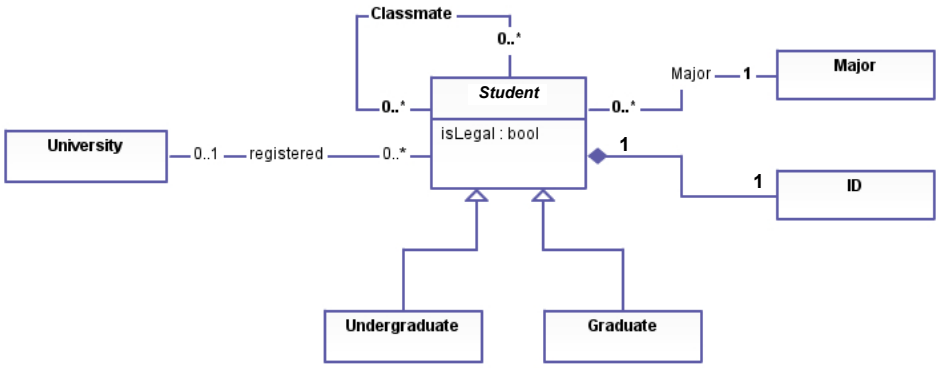
(b) a student should register at a university, and only registered students are legal students;

(c) every student has a unique student ID, and he or she has exactly one major;

(d) students with the same major are regarded as classmates, students can have several classmates.

(e) graduates and undergraduates are never classmates

Try to stick roughly to the UML-design from last weeks exercise:



Exercise 3

Download the .zip-file containing additional files from the course website. Open the files below and answer the questions in the comments:

1. Properties of binary relations. File: properties.als
2. Refactoring navigation expressions. File: distribution.als
3. Doris Day's song. File: everybody.als
4. Barber paradox. File: barber.als
5. Modeling the Tube. File: tube.als