

This is an English translation of the experiment handouts for the evaluation of FlexiSketch.

The original handouts used for the experiment are in German and can be found here:

https://files.ifi.uzh.ch/rerg/flexisketch/Handout_Complete_de.pdf

Modeling: Exercise with Android-Tablet

Please go through this document page by page. Flip a page only when you elaborated all tasks and finished reading it.

Welcome to the modeling exercise and our experiment

Your task

In this experiment, you will use the Android-App "FlexiSketch" to draw a diagram. In "FlexiSketch", any drawings are possible. Therefore, the App has to learn what you are drawing. For the App to be able to interpret your diagram, you have to use additional functions during the experiment to assign meanings to the individual elements of the diagram. The goal is to have all elements defined at the end.

There is a Wizard that you can invoke at any time ("Wizard" in the main menu of the App). It will help you to define the individual diagram elements. At what point in time you call the Wizard or use the functions to define the elements is up to you. But be aware that the more complete the diagram is, the better the Wizard can help you, because it learns over time. Also, we recommend making sure that all diagram elements are defined at the end of the modeling exercise.

Don't be afraid


This exercise is not about measuring your performance. Instead, it is about figuring out whether the App supports you enough so that you can solve the given assignments. In order for us being able to assess how good the App fulfils its duty, we ask you to solve the following assignments as good as possible.


Work alone and quiet, and without any other aids. Wave your hand if you have questions about the task descriptions. A supervisor will come to you.



If for any reason you would like to withdraw from the experiment, such that your result is not evaluated, please inform a supervisor.

Please start now the Android-App "FlexiSketch" as described

1. Wake up tablet from stand-by with a short push on the power button on the frame of the tablets (usually at the top).

2. Unlock tablet: drag the lock  to the far right.

3. If the home-screen is not displayed, tap on the home button at the bottom edge of the screen. 

4. Touch the FlexiSketch icon  to start the app. (If it is not on the home-screen, you find it in the menu „all apps“ )

Please stay within the FlexiSketch app during the experiment.

If the "FlexiSketch" App crashes during the exercise, please inform a supervisor.

You may now flip the page and start with the tutorial.

Tutorial

Familiarize yourself with the "FlexiSketch" app during the next minutes:

Draw

1. Draw a rectangle on the white area.
2. Select the rectangle (short tap and release, without moving the finger).
3. Touch the selected rectangle again and drag it by moving the finger.

Assign types

5. Select the rectangle, and tap the plus-icon above the rectangle. Enter "activity" and push ok. The rectangle is now an instance of type "activity"
6. Open the lower slider on the right edge by dragging or tapping on it.
7. A miniature rectangle is in the slider, because you defined a type in step 5. Touch the miniature rectangle, don't move the finger for one second, then drag the miniature rectangle onto the drawing canvas (a new rectangle gets created).
8. If you draw again a rectangle by hand in the same way, and if it looks similar enough, the tool will ask you at the bottom edge of the screen whether this is also from the type "activity". If you tap on that field, you confirm it.

Text boxes

9. Select one of the rectangles. tap on the "T"-icon above the rectangle. Enter "login" and push "ok".
10. Select the new text box below the rectangle. Touch it again to drag the text into the center of the rectangle.
11. De-select the text box by tapping anywhere on the white area.

Merge pre-built symbols

12. Open the upper slider on the right edge, select the icon with the geometric figures. Choose the rectangle from the displayed options and tap on "ok". Touch the white are anywhere and move the finger across the screen to span a geometric rectangle.
13. Repeat the last step with a triangle, and rearrange the shapes to form a house.
14. The house contains of two individual symbols (rectangle and triangle). To change this, select one of the symbols, tap on the magnet in the appearing menu. Then, tap on the other symbol. The symbols are now merged into one. Caution: the symbols cannot be split again afterwards. If one of the symbols had a type (step 5), it loses the type when it gets merged.
15. Select the house and tap on the trash bin in the appearing menu to delete the house.
16. Open the main menu of the app (the three dots in the upper right corner) and choose „Clear Sketch“.
17. Drag two rectangles of type "activity" from the lower slider onto the drawing area. Place them in a way such that they do not touch each other (like in step 7).
18. Draw a stroke that starts inside one of the rectangles and ends inside the other. The tool automatically creates a link.
19. Select the link by tapping on the light gray circle in the middle of it. Choose the pencil and change the appearance to a line with an arrow. Push "ok".

Wizard and C-icon

20. Open the main menu and choose "Wizard".

21. The wizard asks you about the type of the link. Tap on "Define" and enter "uses" as type. Caution: if you change the appearance of the link later on, it loses its type.

If the wizard asks about the types of unimportant elements (e.g., small strokes that you made by mistake), you can skip the questions with "skip" or delete the symbol with "Delete".

22. Now the wizard asks you to define the cardinalities of the link type. Push "ok", select the link, and tap on the "C"-icon. The upper line asks how many "uses" links may leave from one "activity" type, going to other "activity" types. Enter "0" for the minimum and "*" for the maximum ("-1" or "N" also work). This means that an "activity" type may "use" an arbitrary amount of "activity" types.

23. The lower line asks if one and the same "activity" type may be "used" by multiple "activity" types. You may decide on your own what you enter here. If you, e.g., enter "1" for the minimum, it means that each "activity" must be "used" by at least one other "activity". Tap on "Set Values".

24. Skip possible further questions until the wizard closes itself.

25. You can also assign a type to a link by using the plus-icon. Remark: Links cannot be dragged from the slider to the drawing canvas with drag&drop (see step 7). But the app automatically recognizes links with the same appearance as links that you have already defined (step 20).

26. The C-icon menu is only available when both connected symbols, as well as the connecting link, have types assigned.

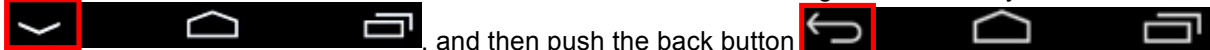
Delete types

27. You can delete a created type (step 5 and 20) if you select it from the lower slider on the right edge (keep finger steady for one second) and then drag it onto the trash bin instead of the drawing area.

Save, load, delete drawings

28. Open the main menu of the app (the three dots in the upper right corner) and choose "Save / Load". On the appearing screen, you can enter "test" next to "Save current sketch" and confirm with "Save". If you instead select an entry below "Load another sketch", you load a previously stored sketch.

29. To exit the "Save / Load" menu, use the buttons at the bottom edge: close the keyboard



30. **Delete everything you did so far:** Open the main menu of the app (the three dots in the upper right corner) and choose "Clear All". This deletes the drawing area as well as the entries in the lower slider.

This concludes the tutorial.

Important

- If you define symbols or links during the next task (like in step 5), please use meaningful names!

- There is a function to scroll the drawing area. Please do **not** use this function. Draw your diagram for the next task in a way such that you can see the whole diagram on the screen at once!

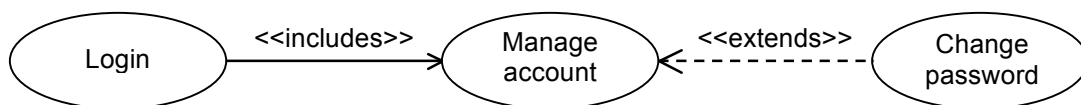
Please do now continue with the next task on the next page.

Assignment

What follows is an assignment to describe a railway information system. Your task is to draw a **UML Use Case Diagram** and teach this diagram-type to the app by **defining the used constructs**. You can define constructs at any time, or you can invoke the wizard, which helps you in doing so. You may also save your progress at any time. But if you load, some information gets lost! Now, work through the following steps:

0. (If you are not sure whether the app is in its initial state, repeat the last step of the tutorial.)
1. Write down the current time: _____
2. Draw a Use Case Diagram according to the following description. The following rules apply:

Do **not** model the system boundary. To add text to a symbol, use the "T"-icon of the respective symbol. If you would like to add text to a link, use the text icon from the upper slider on the right side of the screen. Use the notation for Use Case Diagrams that you learned in the lecture, with one exception: please use graphically different links for <<includes>> and <<extends>>. Example:



The notation from the lecture, together with this exception, is the notation that you should teach to the app. Additionally, there is a rule that each actor in the diagram must be connected to at least one use case.

Assignment for describing the railway information system





The railway information system – Statements of an employee

Rail customers and employees can login to the system. All other functionalities require that the persons log in or are already logged in.

A logged in employee can manage the ticket prices in the system. A logged in rail customer can buy tickets. This case may imply that the customer selects a return journey from multiple options (if the ticket is valid for both ways).

3. Make sure that your notation is completely defined.
4. Save your diagram, use your identification number as file name (it is of the form xxxxxxx)
5. Write down the current time: _____ and flip the page.

Upload your results to the server. If you have difficulties performing this step, ask a supervisor for help.

1. Exit FlexiSketch with 
2. Open an internet browser ( or ) and log in with your username and password. If the landing page does not appear, make sure that you are connected to the network "fhnw-public".
3. Got to **tinyurl.com/c25ymqb**
4. In the form, tap on "Choose File". And...
5. ...choose the ES File Explorer („select“)  (or choose the explorer you are familiar with)
6. Navigate to your solution, and pick the zip file with your identification number:
(sdcard) / Android / data / ch.uzh.ifi.erg.flexisketch / files / xxxxxxxx.zip
7. For the question "*Pick up file as*" choose "File Way".
8. Tap on "send" to upload your solution. Please only upload the file once, i.e. only push once on "send".

After the website tells you that the upload was successful, continue as follows:

If you used your own private tablet, we would be very glad if you could keep the data from the experiment and the "FlexiSketch" app unaltered on your device for two additional weeks.

Carefully put the tablet away.

Use the **computer** (not the tablet, as this may lead to a sudden termination of the survey) to answer the short questionnaire at:

<https://de.surveymonkey.com/s/flexisketch>

Flip the page when you are done.

You reached the end of the experiment! 😊

With this experiment we investigate if the "FlexiSketch" app makes it possible that persons without metamodeling expertise can create metamodels (i.e. models of models. Metamodels describe how models are constructed). To create a metamodel, the app automatically gathers some information and asks the user for more information.

- If you already have metamodeling experience, but did not mark this in the survey, please make a cross in the following field.

I already have metamodeling experience

Before you go, please let a supervisor confirm that all your data has been received.

Please return all sheets and the tablet (if it is not your own one) to the supervisors!

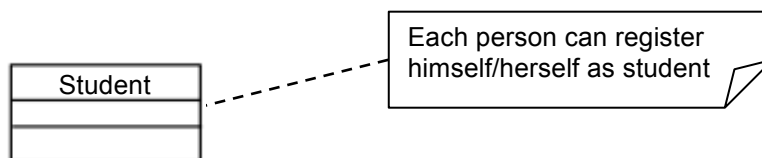
DESCRIPTION FOR THE CLASS DIAGRAM EXERCISE ***(the other pages are identical to the Use Case Diagram Handouts)***

Assignment

What follows is an assignment to describe a railway information system. Your task is to draw a UML Class Diagram and teach this diagram-type to the app by defining the used constructs. You can define constructs at any time, or you can invoke the wizard, which helps you in doing so. You may also save your progress at any time. But if you load, some information gets lost! Now, work through the following steps:

0. (If you are not sure whether the app is in its initial state, repeat the last step of the tutorial.)
1. Write down the current time: _____
2. Draw a Class Diagram according to the following description. The following rules apply:

Do **not** model attributes, operations, and cardinalities. To add text to a symbol, use the “T”-Icon of the symbol. If you want to add text to a link, use the text element from the upper slider on the right edge. Use the notation for Class Diagrams as you have learned it in the lecture. In addition, there is a “note” symbol that allows for adding information and comments, which cannot be depicted in Class Diagrams otherwise. Example:



The notation from the lecture, plus the “note” symbol and “note” link, is the notation that you should teach to the app.

Assignment for describing the railway information system

The railway information system – Statements of an employee

There are several trains. Trains can serve multiple routes. Each route can contain some train stations. There are two types of trains: Interregios and Regional Trains.

There is a rule saying that all numbers of Regional Trains need to comply with the railroad format BF409. Furthermore, our system only records train stations that are active at the moment.

3. Make sure that your notation is completely defined
4. Save your diagram, use your identification number as a file name (it is of the form xxxxxxx)
5. Write down the current time: _____ and flip the page.

*[Handouts for control
group with paper]*

Modeling: Exercise about sketching UML diagrams

Please do only flip a page after finishing reading and elaborating on it, unless it is stated that you may flip a page early.

Introduction

Welcome to the modeling exercise and our experiment

Your task

In this experiment, you will draw two UML diagrams on paper. In addition, the handouts will ask you some questions about your drawings. Please answer the questions if you know the answers (or if you believe to know the answers). If you really cannot answer a question, write down "k.a."

The questions and assignments about your drawings are about the meanings of the individual symbols and links in the diagrams. In principle, it is about describing the used diagram type with little effort. The additional information could help a person with no UML knowledge to interpret your diagrams. In the best case, he/she can conclude from your answers what one is allowed to draw in these diagrams, and what violates the notation.

Don't be afraid

This exercise is not about measuring your performance. Instead, it is about figuring out whether the questions about the modeling exercise are posed in a way such that you can easily answer them. For us to estimate how much we succeeded in doing so, we need you to answer the following questions as much as you can.

Work alone and quiet, and without any other aids. Wave your hand if you have questions about the task descriptions. A supervisor will come to you.

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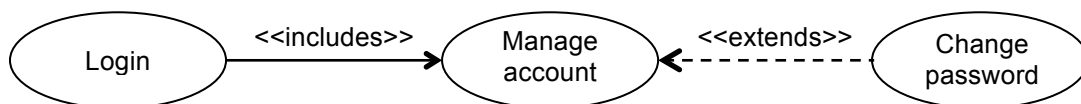
Assignment 1

What follows is an assignment to describe a railway information system. Your task is to draw a **UML Use Case Diagram** and to solve some follow-up assignments about your drawing. The assignments help you to **define the constructs that you used** in your diagram. Now, work through the following steps.

! Before you read on, note down the current time NOW: _____

Draw a Use Case Diagram on a separate sheet according to the following description. In addition, you may elaborate on **assignment 2** and **3** on the following pages at any time, and then continue on the diagram. You can find **assignments 2** and **3** on the next two pages. When you finished the diagram, check once more whether **assignments 2** and **3** are complete as well. The following applies to the diagram modeling:

Do **not** model the system boundary. Use the notation for Use Case Diagrams as you have learned it in the lecture, with one exception: please use different visual links for <<includes>> and <<extends>>. Example:



The notation from the lecture, together with this exception, is the notation that you subsequently make interpretable for an external person by elaborating on assignments 2 and 3 (since it is an experiment, this person does not exist). In addition, there is a rule that every actor in the diagram has to be connected to at least one use case.

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A logged in employee can manage the ticket prices in the system. A logged in rail customer can buy tickets. This case may imply that the customer selects a return journey from multiple options (if the ticket is valid for both ways).

Assignment 2

On the left side, draw ALL different types of symbols and links (below each other), which you used for the UML Use Case Diagram. In the right column, write down the type of each symbol or link. (Later, this allows to call each element by its name. Example: in a state chart, there would be a rectangle with rounded corners with the type "state".)



Assignment 3

a) Draw all different **connection types** that you used in the model below each other. For this, use the type definitions from the previous page.

A connection type is defined by three types in total:

1. The type of the symbol, from where the link starts ("start symbol").
2. The type of the symbol, to where the link goes ("end symbol").
3. The type of the link.

b) Provide the cardinalities: for each connection type, write down **how many** "end symbols" may be connected to the **same** "start symbol" (with this connection type). Provide a minimum and a maximum. (*E.g., $min = 0$ and $max = n$ means that one "start symbol" may be connected to none, or up to an arbitrary amount of "end symbols".*)

c) Provide the cardinalities: for each connection type, write down **how many** "start symbols" may be connected to the **same** "end symbol" (with this connection type). Provide a minimum and a maximum.

Connection type

b) min max

c) min max

Please flip the page only after finishing assignments 1, 2 and 3.

4. Write down your name on the sheet with the Use Case Diagram. If you used multiple sheets, e.g., for drafts or unsuccessful attempts, please also write your name on them (and also deliver them at the end).
5. Note down the current time NOW: _____
6. For each type you defined in assignment 2, write down its meaning in one or two sentences (i.e., what the type represents, or what it can be used for).

Type

Meaning

After finishing steps 4, 5, and 6, please flip the page.

[Note: The original handouts contain further pages with additional exercises not related to the experiment.]

Modeling: Exercise about sketching UML diagrams

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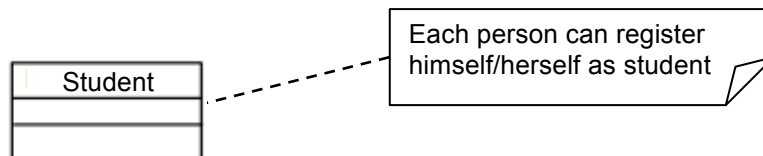
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Meaning

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