

Assignment 5

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5.1 Frameworks

Your development team made suggestions for a framework as the technologic basis the project “SWCArchitect”. Your task is now to evaluate this framework, how it fits the requirements.

Therefore, analyze the JHotDraw Framework with the help of your domain model and your use cases:

- Find existing interfaces which correspond to the behavior of domain objects
- Find existing reusable or extendable components

Describe und explain your findings and how you would use them to implement the SWCArchitect.

What kind of framework is JHotDraw?

Is it a good choice? Justify your answer.

5.2 Components

Your team also provides a list of possible components. Do they follow the important rules and properties of component design?

Decide for each of the following suggestions if they are components and justify your answer. In the case of a good component candidate extend the description with

- Interfaces
- Interactions with other components
- Included classes or entities
- Integration with JHotDraw

In case of a bad suggestion, please revise and provide a better solution for the following components:

- SketchImporter: imports the existing sketches and place as a background image
- FlatModeler: defining flat, place flat elements (walls, doors), place furniture elements (tables, chairs)

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- ImageExporter: export drawings as jpg, pdf, png ...
- WebPublisher: exports a drawing to a remote publishing service
- FurnitureFactory: generates furniture elements
- ChairTableGrouping: takes two or more tables and chairs and merges them to one figure
- ConstraintValidation: after each movement of an element this component checks if certain constraints are violated

5.3 Implementation

Implement all necessary components to draw the flat based on an underlying image and to place furniture elements inside this flat.

- Create your own toolbar with your SWCArchitect specific elements and actions.
- Implement the functionality to import an existing floor plan image as a background for further architectural work. The Image has to be placed in the upper left corner.
- Implement the necessary elements to sketch a flat, e.g. walls, doors, window, room.
- Implement the necessary furniture elements and the required catalog, e.g. chairs, plants, refrigerator, stove, bathtub, etc. ...
- Implement the functionality to export your drawn flat as an image file.
- Implement the component to create custom furniture elements and reuse them during a drawing session. (You may create a fix amount of buttons and assign custom elements to these buttons)
- Save your custom elements and load them on start.

Please note: Your components must allow only reasonable actions on the elements (e.g. think about resizing).

Please explain your decisions for your software design and implementation of **each** component, especially point out used patterns. Provide appropriate UML diagrams.

You can clone JHotDraw from:

<https://git.rwth-aachen.de/swc-public/teaching/jhotdraw>

For your implementation **DON'T** change the framework itself, place your implementation inside your own package: de.rwth.swc.oosc.groupXY

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Hint: you can reuse the implementation of the Sample Application
(org.jhotdraw.samples.draw) as a possible template.

5.4 Use the SWCArchitect

Use your application to sketch your home flat/house here in Aachen.

- Make a manual pencil drawing of your flat
- Import your drawing into your application
- Use your application to resketch the drawing.

The plan should be realistic (e.g. numbers of furniture elements).
You may use the provided plan

Please provide the base drawing and the exported plan from your SWCArchitect.