Learning Assignment

We discussed the decorator pattern in class. You should now be able to solve related problems (with related design patterns) as well.

Think about how you could solve the following problem: Implementation of a joker tool.
The Joker tool has the following special property:

- Before it is clicked for the first time, it displays a question mark.
- The first time you click on it, a dialog opens, where you can select a `.class` file of a concrete tool. This tool is then loaded into the system.
- After the first click, the joker tool no longer displays a question mark but rather the icon of the loaded tool. In addition, it behaves like the loaded tool. The user no longer realizes that he is actually working with the Joker tool.

How could such a joker tool be implemented?

Tasks:

1. The task resembles the decorator pattern, because after the first click, the joker tool is also a wrapper for the loaded tool, but this special application is called proxy pattern.
   Look up the proxy pattern in your books and on the internet.

2. Apply the proxy pattern. More precisely:

   a) Draw the structure diagram for the given context with JDraw and the joker tool.

   b) Name the participating objects and describe their roles.

3. Look for other typical applications of the proxy pattern.

   a) In general (try not to copy ideas you find in the books and on the internet only, develop your own ideas)

   b) Where could the proxy pattern be applied in JDraw?

Make sure you know enough about this new design pattern to answer possible questions asked in an exam. You could also fire questions at your teacher.

PS: A concrete implementation of the JokerTool has its pitfalls and is therefore left as an optional exercise to the ambitious student ☺.