# BDSA - Assignment 3

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## GitHub Repository

https://github.com/mfoman/assignment-03

## 1 Software Engineering

### Exercise 1

- What level of detail should UML models have?
- What is the difference between structure diagrams and behavior diagrams in UML?
  - Provide two examples per category.

#### Answer

- UML models have the potential to have lot details added. However, these details should not be added most of the time. It can make the models confusing and make it hard to understand the essential nature of the UML model. So generally speaking, a UML model should have a low level of detail.
- Structure Diagrams illustrates the static elements in a system. This could be objects, classes, interfaces, etc. These types of diagrams are widely used to document the software architecture of a system. Class Diagrams and Obejcts Diagrams are both examples of Structure Diagrams. Behavior Diagrams, on the other hand, illustrates the dynamic elements in a system. This is how this system behaves and how it communicates with itself and other elements. You could say that a Behavior Diagram visualizes how the system works in motion. Use Case Diagrams and Sequence Diagrams are both examples of Behavior Diagrams.

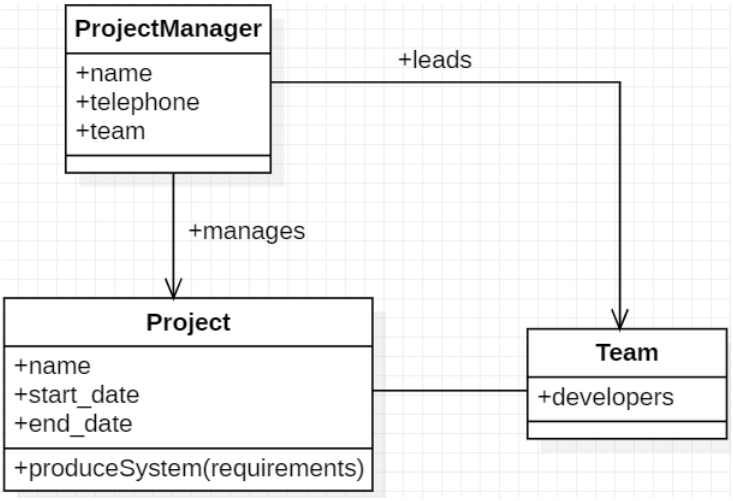
## Exercise 2

Draw a UML class diagram that models the following specifications:

- A project has a name, a start date, and an end date.
- A project is associated to a project manager, a name, a telephone, and a team.
- A project manager manages (by starting and terminating) a project and leads a team that is associated with a project.
- Projects receive as input requirements and produce a system. Both requirements and the system have a completion percentage and a description.
- Each team is composed by developers.

### Answer

Class Diagram. Made in StarUML:

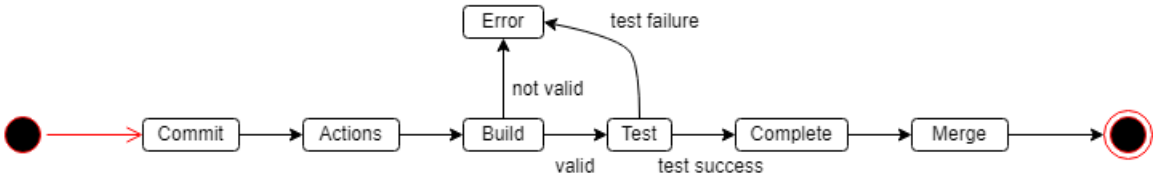



## Exercise 3

Draw a UML state diagram that models your GitHub action configuration. Include all triggers that you have defined.

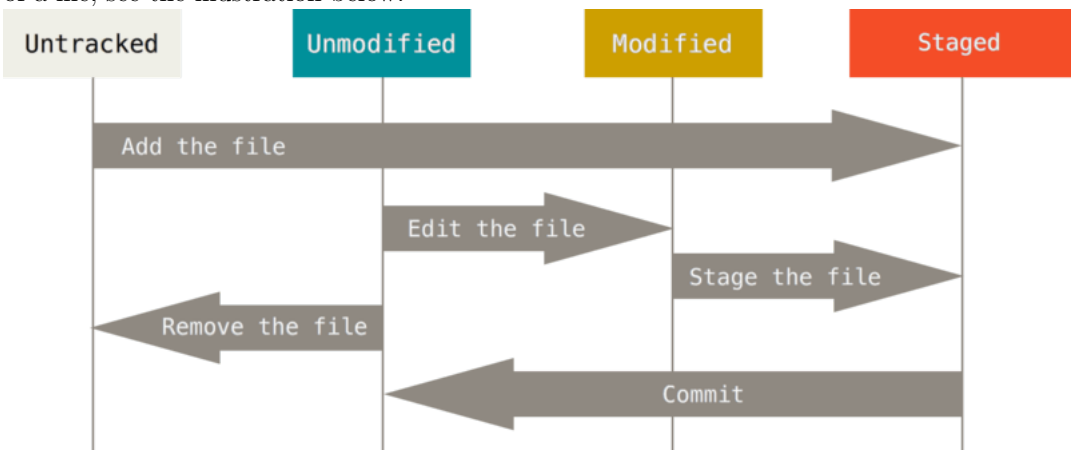
### Answer

State Diagram. Made in draw.io:



## Exercise 4

Files that are under version control with Git (or that should be) are in one of the four states: Untracked, Unmodified, Modified, or Staged, see the respective chapter in the Pro Git book. In that book, the authors provide a sequence diagram instead of a state diagram to illustrate states and state changes of a file, see the illustration below.

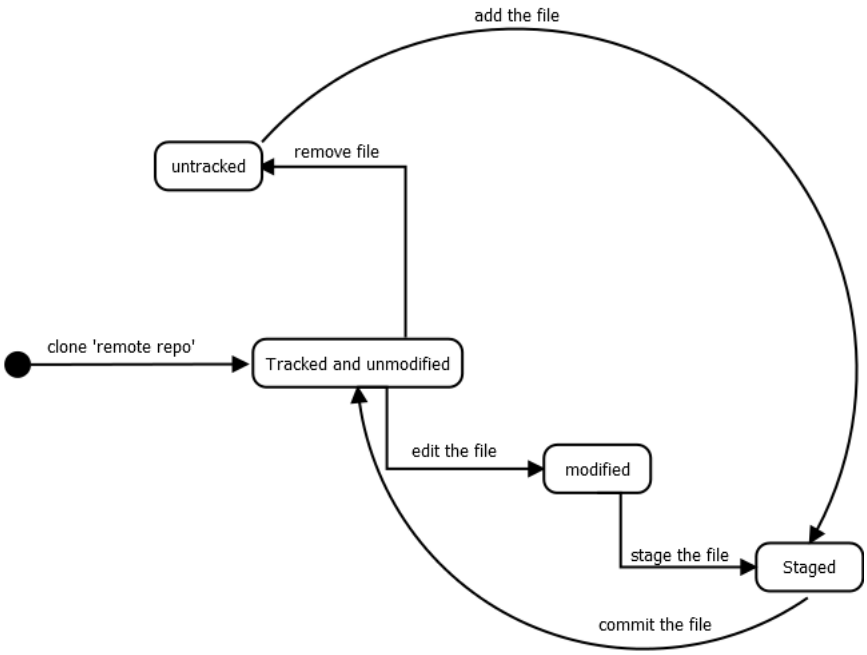



Draw two UML state diagrams that illustrate the states of a single file that is version controlled with Git. Let the first state diagram start with cloning a remote repository containing a file that is then edited. The second state diagram has to illustrate the states of a file that is newly created in a Git repository.

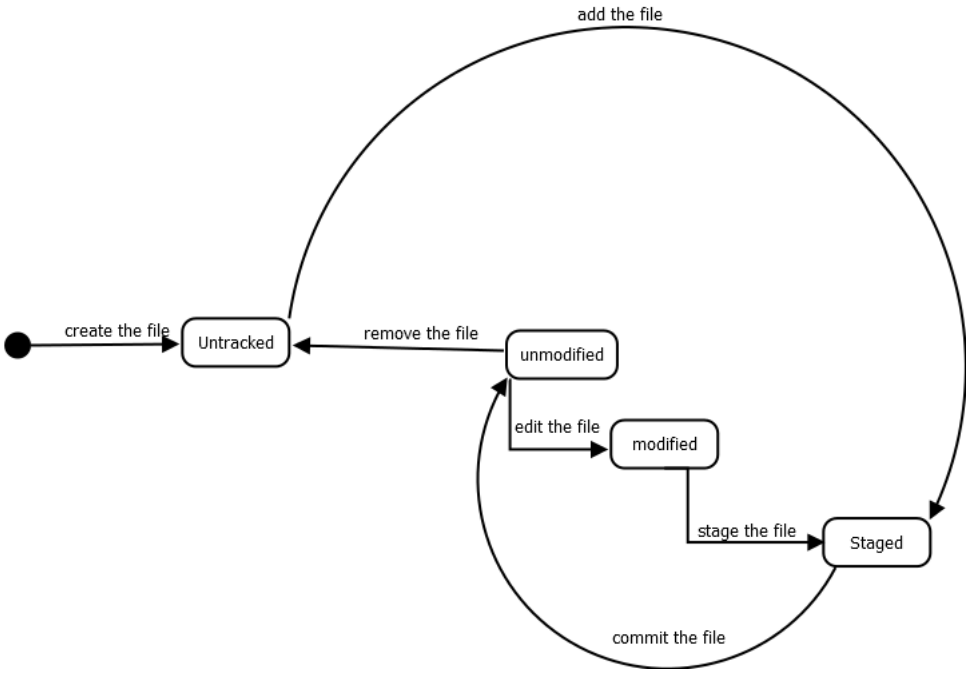
Use the git commands clone, add and commit together with file edits as events that trigger state changes. Can you also illustrate the actions that Git performs on these events with the help of the chapter from the Pro Git book?

### Answer

State Diagram, with cloning a remote repository as the start. Made in Dia.



State Diagram, with newly created file as start. Made in Dia.



## Exercise 5

Translate the UML collaboration diagram (Fig. 14-14 from APPP), see below into a sequence diagram.

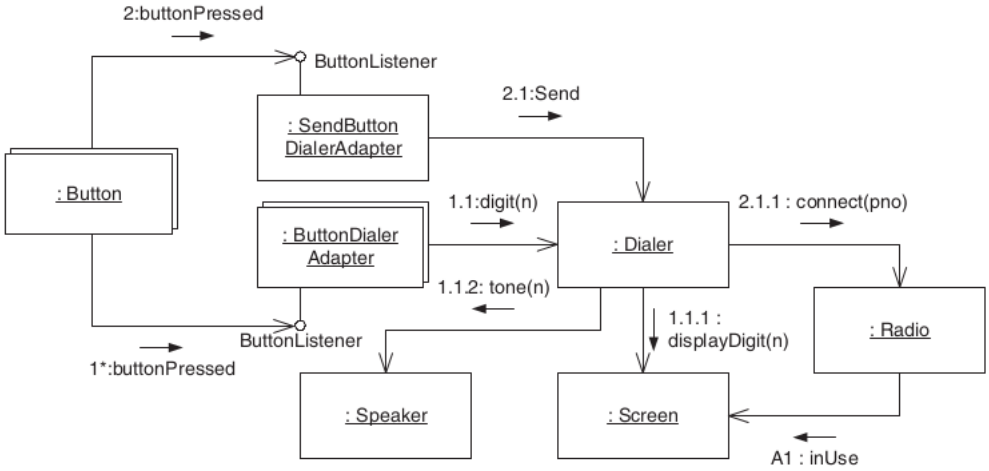
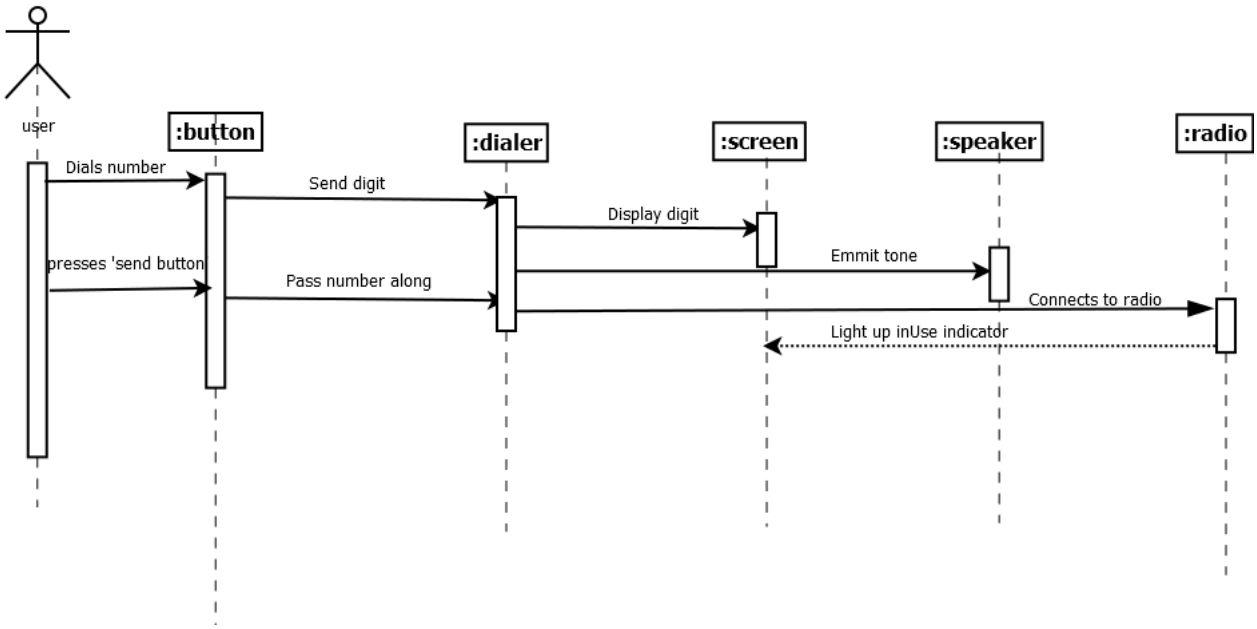



**Figure 14-14**
Adding adapters to the dynamic model

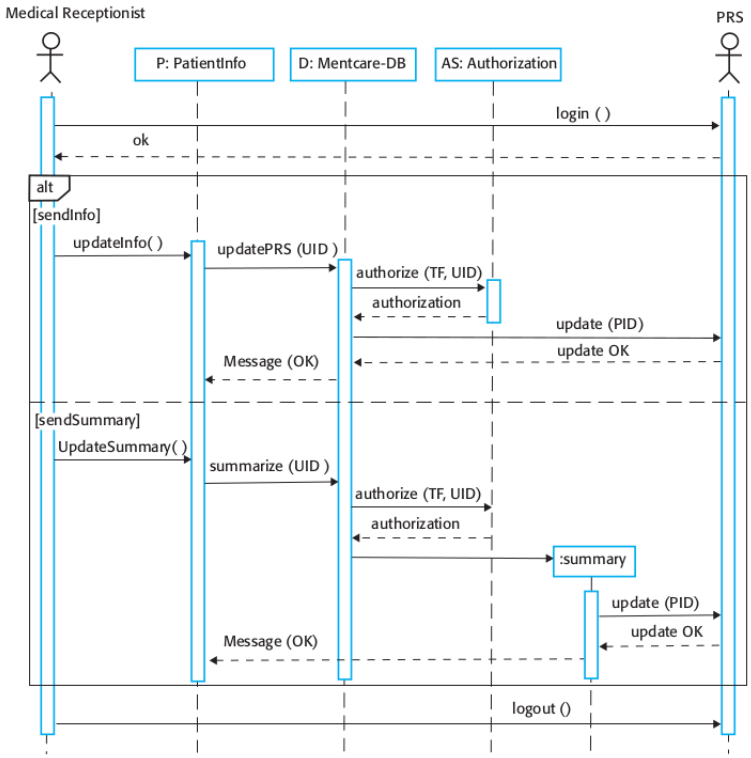
### Answer

Sequence diagram. Made in Dia.



## Exercise 6

Draw a UML class diagram that models the structural information given in Fig. 5.7 from SE, see below.




### Answer

Class Diagram. Made in StarUML: