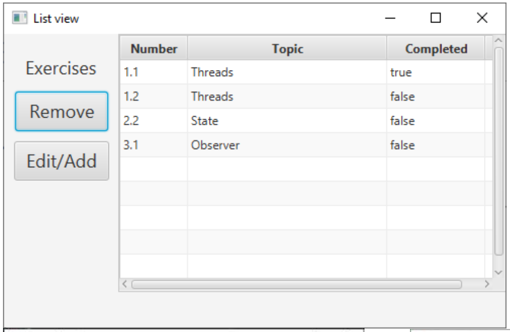
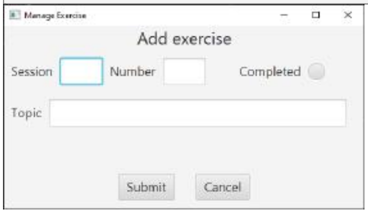
Exercise: MVVM - Exercises

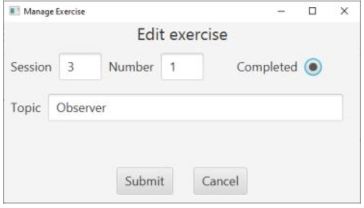
The purpose of this exercise is to create a two-window MVVM application representing SDJ exercises, see below. The two windows are

- Window 1: A list view with a table of exercises as the number, the topic and if completed or not
- Window 2: A manage exercise window, to be used when
  a) Adding a new exercise
  b) Editing an existing exercise (e.g. marking it as completed)
  c) Removing an exercise (as a "are you sure you want to delete" window)

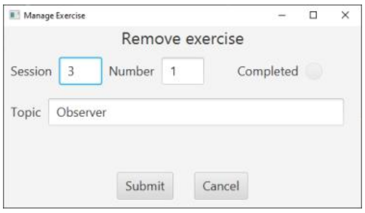


Number	Topic	Completed
1.1	Threads	true
1.2	Threads	false
2.2	State	false
3.1	Observer	false





Session 3 Number 1 Completed ●
Topic Observer



Session 3 Number 1 Completed ○
Topic Observer

- If no rows are selected, when pressing the Edit/Add button in List view, the Manage exercise window opens with empty text fields – and headerLabel with text "Add exercise"
- If a row is selected, when pressing the Edit/Add button in List view, the Manage exercise window opens with filled out text fields – and headerLabel with text "Edit exercise"
- If a row is selected, when pressing the Remove button in List view, the Manage exercise window opens with filled out text fields and deactivated radiobutton and text fields being un-editable – and headerLabel with text "Remove exercise"

The full class diagram is given on the next page. A few notes:

- The class `SimpleExerciseViewModel` represents data in the Table, having properties for `Number`, `Topic` and `Completed` – With types `StringProperty`, `StringProperty` and `ObjectProperty<Boolean>`, respectively
- The Table (in `ListExercisesViewController`) could be declared this way

```
@FXML private TableView<SimpleExerciseViewModel> exercisesTable;
@FXML private TableColumn<SimpleExerciseViewModel, String> numberColumn;
@FXML private TableColumn<SimpleExerciseViewModel, String> topicColumn;
@FXML private TableColumn<SimpleExerciseViewModel, Boolean> completedColumn;
```

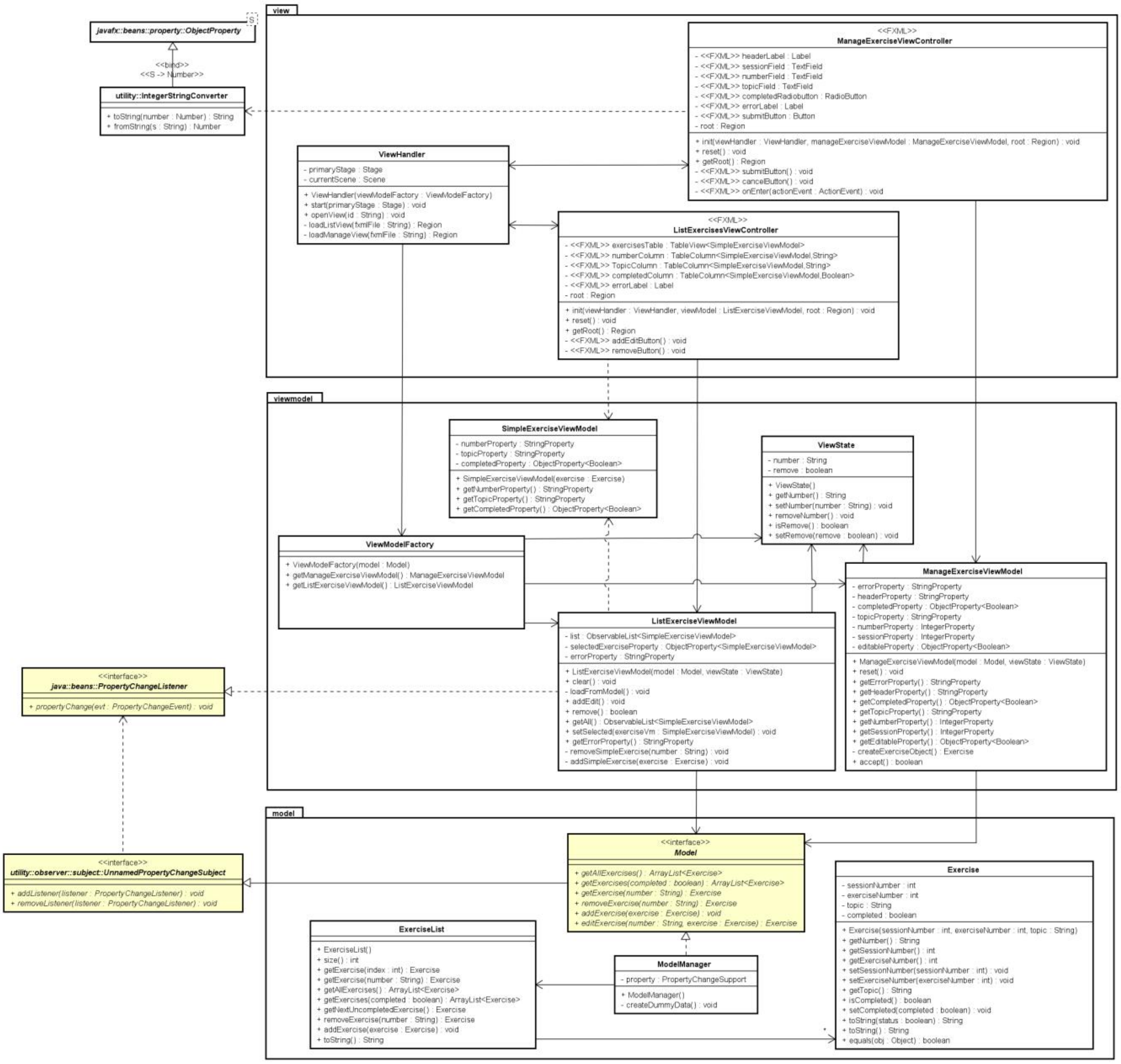
- … and (after class `ListExercisesViewModel` is implemented), the Table and its columns could be connected to `SimpleExerciseViewModel` this way

```
numberColumn.setCellValueFactory(
   cellData -> cellData.getValue().getNumberProperty());
topicColumn.setCellValueFactory(
   cellData -> cellData.getValue().getTopicProperty());
completedColumn.setCellValueFactory(
   cellData -> cellData.getValue().getCompletedProperty());
exercisesTable.setItems(viewModel.getAll());
```

- Class `ListExercisesViewModel` contains an ObservableList of type `ObservableList<SimpleExerciseViewModel>`

- Class `ViewModelState` contains information of the selected row and a boolean if it is remove or not being activated. The `ViewModelState` object is created in the `ViewModelFactory` and passed to the constructors for both `ListExercisesViewmodel` and `ManageExerciseViewModel`. The first one, may set values and the second may get values form this View State object.

Model and FXML files given. Implement the remaining parts of this system.



javafx::beans::property::ObjectProperty
S
<<bind>>
<<S -> Number>>
utility::IntegerStringConverter
+ toString(number : Number) : String
+ fromString(s : String) : Number
view
<<FXML>>
ManageExerciseViewController
- <<FXML>> headerLabel : Label
- <<FXML>> sessionField : TextField
- <<FXML>> numberField : TextField
- <<FXML>> topicField : TextField
- <<FXML>> completedRadiobutton : RadioButton
- <<FXML>> errorLabel : Label
- <<FXML>> submitButton : Button
- root : Region
+ init(viewHandler : ViewHandler, manageExerciseViewModel : ManageExerciseViewModel, root : Region) : void
+ reset() : void
+ getRoot() : Region
- <<FXML>> submitButton() : void
- <<FXML>> cancelButton() : void
- <<FXML>> onEnter(actionEvent : ActionEvent) : void
ViewHandler
- primaryStage : Stage
- currentScene : Scene
+ ViewHandler(viewModelFactory : ViewModelFactory)
+ start(primaryStage : Stage) : void
+ openView(id : String) : void
- loadListView(fxmlFile : String) : Region
- loadManageView(fxmlFile : String) : Region
<<FXML>>
ListExercisesViewController
- <<FXML>> exercisesTable : TableView<SimpleExerciseViewModel>
- <<FXML>> numberColumn : TableColumn<SimpleExerciseViewModel,String>
- <<FXML>> TopicColumn : TableColumn<SimpleExerciseViewModel,String>
- <<FXML>> completedColumn : TableColumn<SimpleExerciseViewModel,Boolean>
- <<FXML>> errorLabel : Label
- root : Region
+ init(viewHandler : ViewHandler, viewModel : ListExerciseViewModel, root : Region) : void
+ reset() : void
+ getRoot() : Region
- <<FXML>> addEditButton() : void
- <<FXML>> removeButton() : void
viewmodel
SimpleExerciseViewModel
- numberProperty : StringProperty
- topicProperty : StringProperty
- completedProperty : ObjectProperty<Boolean>
+ SimpleExerciseViewModel(exercise : Exercise)
+ getNumberProperty() : StringProperty
+ getTopicProperty() : StringProperty
+ getCompletedProperty() : ObjectProperty<Boolean>
ViewState
- number : String
- remove : boolean
+ ViewState()
+ getNumber() : String
+ setNumber(number : String) : void
+ removeNumber() : void
+ isRemove() : boolean
+ setRemove(remove : boolean) : void
ViewModelFactory
+ ViewModelFactory(model : Model)
+ getManageExerciseViewModel() : ManageExerciseViewModel
+ getListExerciseViewModel() : ListExerciseViewModel
ListExerciseViewModel
- list : ObservableList<SimpleExerciseViewModel>
- selectedExerciseProperty : ObjectProperty<SimpleExerciseViewModel>
- errorProperty : StringProperty
+ ListExerciseViewModel(model : Model, viewState : ViewState)
+ clear() : void
- loadFromModel() : void
+ addEdit() : void
+ remove() : boolean
+ getAll() : ObservableList<SimpleExerciseViewModel>
+ setSelected(exerciseVm : SimpleExerciseViewModel) : void
+ getErrorProperty() : StringProperty
- removeSimpleExercise(number : String) : void
- addSimpleExercise(exercise : Exercise) : void
ManageExerciseViewModel
- errorProperty : StringProperty
- headerProperty : StringProperty
- completedProperty : ObjectProperty<Boolean>
- topicProperty : StringProperty
- numberProperty : IntegerProperty
- sessionProperty : IntegerProperty
- editableProperty : ObjectProperty<Boolean>
+ ManageExerciseViewModel(model : Model, viewState : ViewState)
+ reset() : void
+ getErrorProperty() : StringProperty
+ getHeaderProperty() : StringProperty
+ getCompletedProperty() : ObjectProperty<Boolean>
+ getTopicProperty() : StringProperty
+ getNumberProperty() : IntegerProperty
+ getSessionProperty() : IntegerProperty
+ getEditableProperty() : ObjectProperty<Boolean>
- createExerciseObject() : Exercise
+ accept() : boolean
<<interface>>
java::beans::PropertyChangeListener
+ propertyChange(evt : PropertyChangeEvent) : void
model
<<interface>>
Model
+ getAllExercises() : ArrayList<Exercise>
+ getExercises(completed : boolean) : ArrayList<Exercise>
+ getExercise(number : String) : Exercise
+ removeExercise(number : String) : Exercise
+ addExercise(exercise : Exercise) : void
+ editExercise(number : String, exercise : Exercise) : Exercise
<<interface>>
utility::observer::subject::UnnamedPropertyChangeSubject
+ addListener(listener : PropertyChangeListener) : void
+ removeListener(listener : PropertyChangeListener) : void
Exercise
- sessionNumber : int
- exerciseNumber : int
- topic : String
- completed : boolean
+ Exercise(sessionNumber : int, exerciseNumber : int, topic : String)
+ getNumber() : String
+ getSessionNumber() : int
+ getExerciseNumber() : int
+ setSessionNumber(sessionNumber : int) : void
+ setExerciseNumber(exerciseNumber : int) : void
+ getTopic() : String
+ isCompleted() : boolean
+ setCompleted(completed : boolean) : void
+ toString(status : boolean) : String
+ toString() : String
+ equals(obj : Object) : boolean
ExerciseList
+ ExerciseList()
+ size() : int
+ getExercise(index : int) : Exercise
+ getExercise(number : String) : Exercise
+ getAllExercises() : ArrayList<Exercise>
+ getExercises(completed : boolean) : ArrayList<Exercise>
+ getNextUncompletedExercise() : Exercise
+ removeExercise(number : String) : Exercise
+ addExercise(exercise : Exercise) : void
+ toString() : String
ModelManager
- property : PropertyChangeSupport
+ ModelManager()
- createDummyData() : void
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