

Web Dynpro Debugging, Exercises



Topic: Web Dynpro Debugging



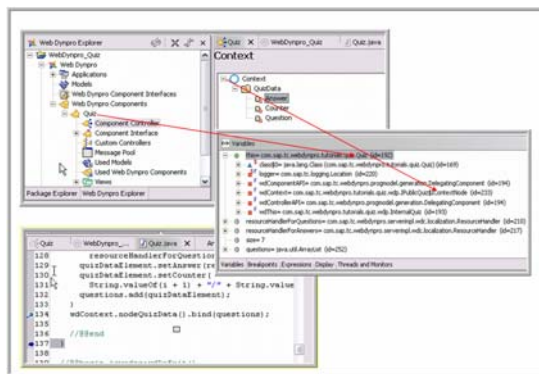
At the end of this Exercise, you are able to:

- 1) Debug and change the Component Context of a running Web Dynpro application.
- 2) *Optional* – HotSwap code

1 Development Objectives

An important part of your programming toolkit should be mastery of debugger. It will help you save time and frustration in locating and eliminating software bugs. You can easily use the debugger as part of your Web Dynpro development environment since it is integrated into NetWeaver Developer Studio. These short exercises will give practical hand-ons experience using the debugger to change program variables and to

2 Result



As a result of this exercise, you will be able to start a debug session, analyze the application state, set breakpoints, and change program variables.

Optional part I:

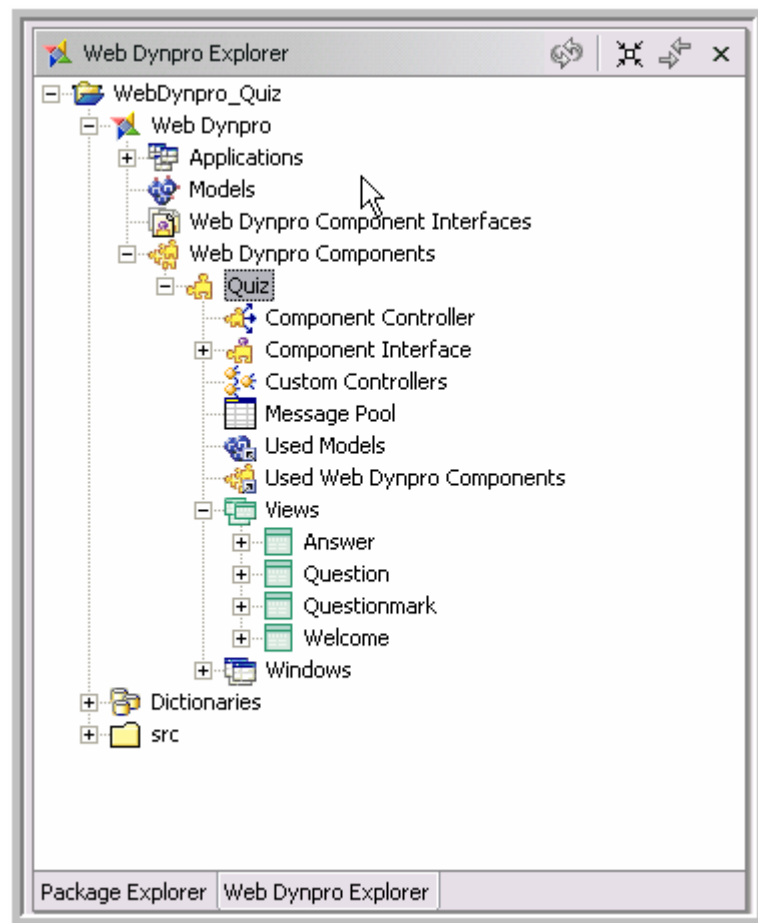
You will learn how you to change code on the fly in a debugging session

3 Prerequisites

You have launched the SAP NetWeaver Developer Studio.

You have selected the Web Dynpro perspective.

The structure of your project *WebDynpro_Quiz* is currently displayed in the *Web Dynpro Explorer*. Please take a moment to deploy and run this application so that you are familiar with the application logic



4 Debugging, Step-by-Step

4-1 Web Dynpro Debugging

4-1-1 Switching Server Nodes to Debug Mode.

4-1-2 Setting a Breakpoint

4-1-3 Defining a Debug Configuration and Starting the Debug Mode

4-1-4 Changing the Web Dynpro Component Context

Your goal is to change 1 of the 7 questions and answers presented in the QuizAPP by locating and changing the members variables of the Component Context

4-1-5 Terminate Debugging

4-2 HotSwap code (Optional Section)

4-2-1 Set a Breakpoint

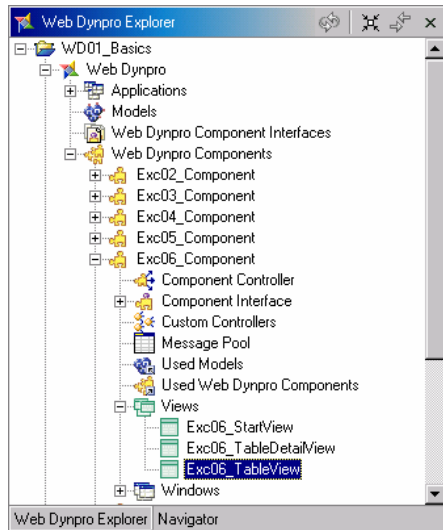
4-2-2 Resume Debugging

4-2-3 HotSwap

Your goal is to change the action of the QuizApp exit button to go to a different URL by using the hotswap feature.

4-2 Define a table UI element for *Exc06_TableView* and bind it to the view context.

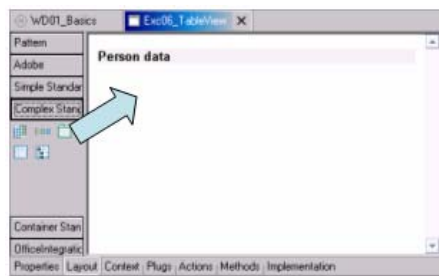
4-2-1 Define a table UI element.



In the Web Dynpro Explorer:

Expand the nodes
WD01_Basics/Web Dynpro/Web Dynpro Components/Exc06_Component..

Select the *Views* node. Open the context menu of *Exc06_TableView*.
Choose *Edit*.



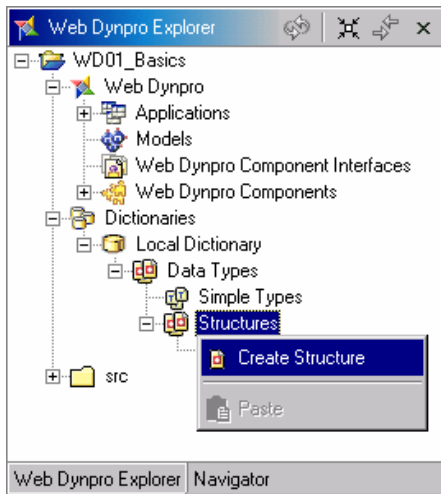
The View Designer for *Exc06_TableView* appears on the right pane

In the toolbar, choose *Complex Standard* and drag and drop *Table* to the editor pane on the right.

Note: Leave the *dataSource* property of the table blank. You will specify this property later.

Save the new project data by choosing *Save All Metadata* from the toolbar.

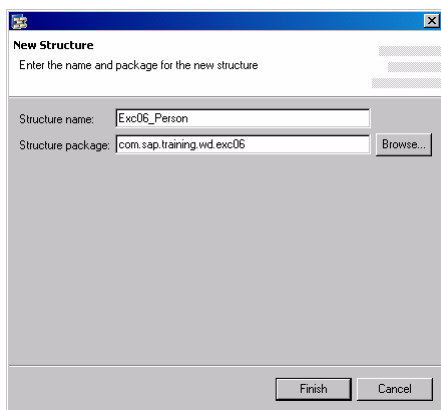
4-2-2 Define a Dictionary structure type.



In the Web Dynpro Explorer:

Expand the nodes
*WD01_Basics/Dictionaries/Local
Dictionary/Data Types.*

Select the *Structures* node. Open the
context menu.
Choose *Create Structure*.



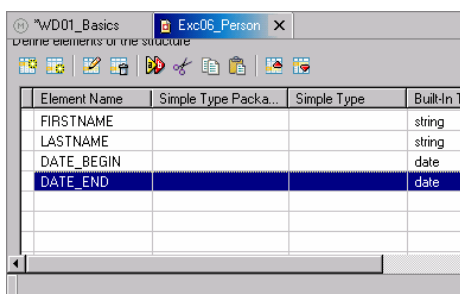
In the wizard that appears, enter
Structure name:

Exc06_Person

Structure package:

com.sap.training.wd.exc06

Choose *Finish*.

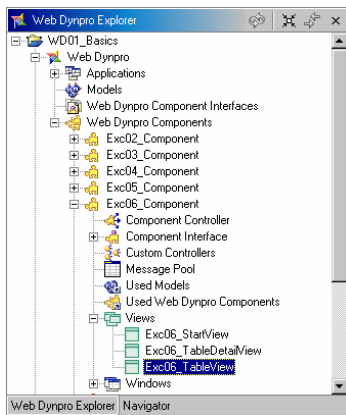


Define the elements of the structure.
Assign the following property values:

Element name	Built-in type	Not null
FIRSTNAME	string	x
LASTNAME	string	x
DATE_BEGIN	date	
DATE_END	date	

Save the new project data by choosing *Save All Metadata* from the toolbar.

4-2-3 Create the view context for view *Exc06_TableView* with structure binding.

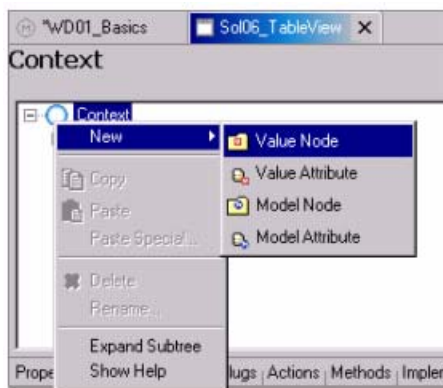


In the Web Dynpro Explorer:

Expand the nodes
WD01_Basics/Web Dynpro/Web Dynpro Components/Exc06_Component..

Select the *Views* node. Open the context menu of *Exc06_TableView*.

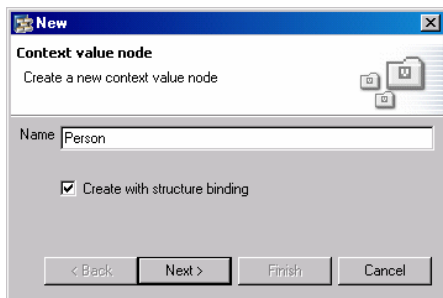
Choose *Edit*.



The View Designer for *Exc06_TableView* appears on the right pane

Choose the *Context* tab

Open the context menu for the root node *Context* and choose the option *New/Value Node*.

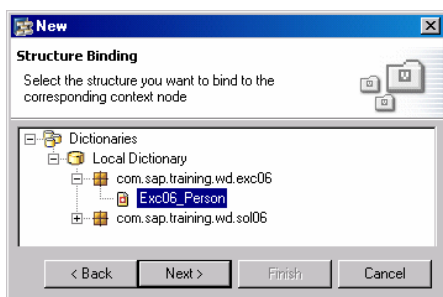


In the wizard, enter

Name: Person

Select “Create with structure binding”

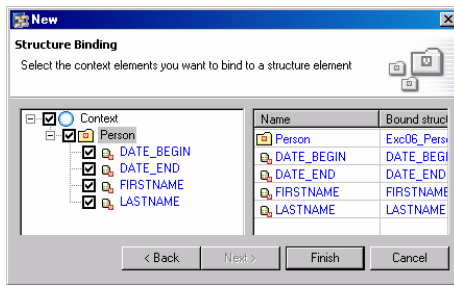
Choose *Next*.



Select structure

com.sap.training.wd.exc06.
Person

Choose *Next*.

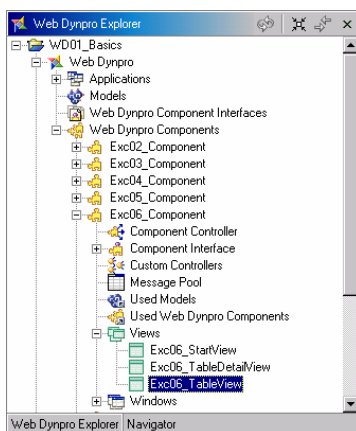


Select the structure elements *firstname*, *lastname*, *date_begin*, and *date_end*.

Choose *Finish*.

Save the new project data by choosing *Save All Metadata* from the toolbar.

4-2-4 Define the table binding and the *dataSource* property.

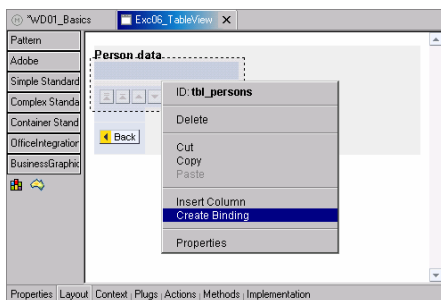


In the Web Dynpro Explorer:

Expand the nodes
WD01_Basics/Web Dynpro/Web Dynpro Components/Exc06_Component..

Select the *Views* node. Open the context menu of *Exc06_TableView*.

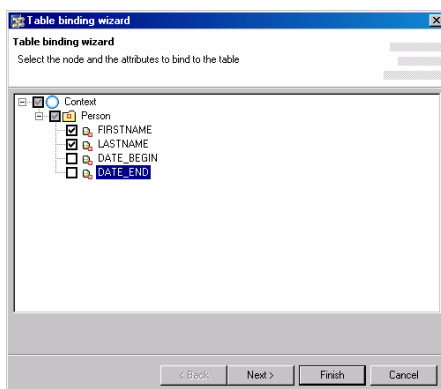
Choose *Edit*.



The View Designer for *Exc06_TableView* appears on the right pane

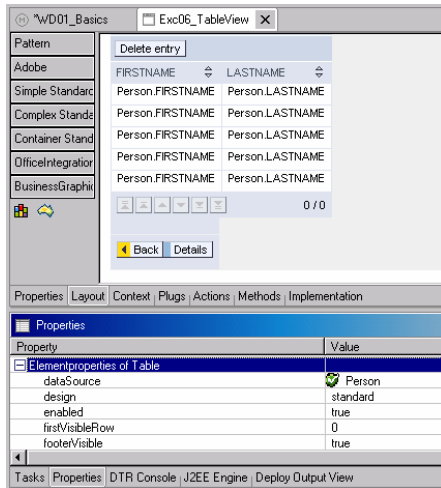
Choose the *Layout* tab and then choose the table UI element.

Open the context menu and choose *Create Binding*.



In the wizard that appears, select *firstname* and *lastname*.

Choose *Finish*.



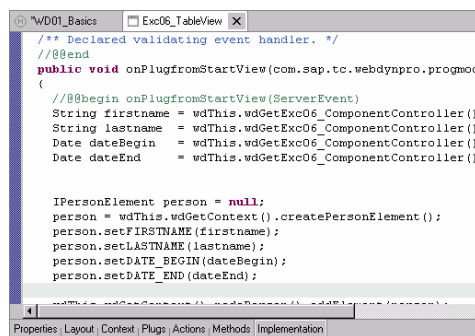
Open the View Designer for *Exc06_TableView* and choose the table UI element again.

Open the properties editor.

Click on the button near the *dataSource* field and select *Person* from the context.

Save the new project data by choosing *Save All Metadata* from the toolbar.

4-2-5 Add the values of the input fields of *Exc06_StartView* to the table of *Exc06_TableView*.



Open the View Designer for *Exc06_TableView* again.

Choose the Implementation tab.

Add the following lines to the event handler method *onPlugFromStartView()*:
Note: Some of the following methods were generated by Web Dynpro after you've specified the context value nodes and values. Because of that, the methods names you have to choose can differ from the following names:

```
public void onPlugfromStartView(
    com.sap.tc.webdynpro.progmodel.api.IWDCustomEvent wdEvent ) {
    //@@begin onPlugfromStartView(ServerEvent)
    String firstname =
        wdThis.wdGetExc06_ComponentController().wdGetContext().
        currentContextElement().getCmpCtx_firstname();
    String lastname =
        wdThis.wdGetExc06_ComponentController().wdGetContext().
        currentContextElement().getCmpCtx_lastname();
    Date dateBegin =
        wdThis.wdGetExc06_ComponentController().wdGetContext().
        currentContextElement().getCmpCtx_dateBegin();
    Date dateEnd =
        wdThis.wdGetExc06_ComponentController().wdGetContext().
        currentContextElement().getCmpCtx_dateEnd();

    IPersonElement person = null;
    person = wdThis.wdGetContext().createPersonElement();
```

```

    person.setFIRSTNAME(firstname);
    person.setLASTNAME(lastname);
    person.setDATE_BEGIN(dateBegin);
    person.setDATE_END(dateEnd);

    wdThis.wdGetContext().nodePerson().addElement(person);
    //@@end
}

```

This method is called, after the user has made some changes to the input fields in the StartView and pressed the Next button.

The Web Dynpro automatically stores the values of the input fields to the component context. Before the TableView is shown, the `onPlugFromStartView` is called. Here you'll get the values from the component context, create a new person element, set the attributes of the person element with the context data, and create a new person node in the view context. Because the view context is bound to the table as data source, the data is then shown in the table.

Save the new project data by choosing *Save All Metadata* from the toolbar.

4-5 Create a Web Dynpro application

In the Web Dynpro Explorer, expand the *WD01_Basics* node.

Expand the *Web Dynpro* node and open the context menu for *Applications*.

To open the wizard, choose *Create Application*.

In the wizard, enter:

Name: WD01_Basics_Exc05
 Package: com.sap.training.wd.exc05
 Accept the other suggested values and choose *Next*.

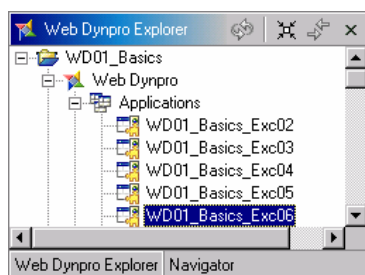
Select *Use existing component* and choose *Next*.

Select

Web Dynpro Component	Exc05_Component
Interface View	Exc05_WindowInterfaceView
Startup Plug	Default

and choose *Finish*.

Successful result:



The generated Web Dynpro application object completes your project structure. You are now in a position to trigger deployment. *WD01_Basics_Exc05* enables you to address the Web application as a whole, when you launch this complete application in the next step.

5 Building, Deploying, and Running, Step-by-Step

5-1 Deploy and run the Web Dynpro application.

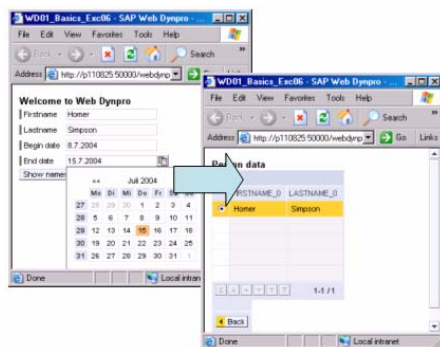
In the Web Dynpro Explorer:

Expand the nodes *WD01_Basics* node/*Web Dynpro/Applications*.

Open the context menu for *WD01_Basics_Exc06*.

To deploy and run the application, choose *Deploy new Archive and Run*

Successful result:



The Developer Studio launches the Web browser and chooses the active view *Exc06_StartView*.

You can insert some values in the input fields and choose the Next button.

The values are stored in the table UI element that is shown in the *Exc06_TableView*.

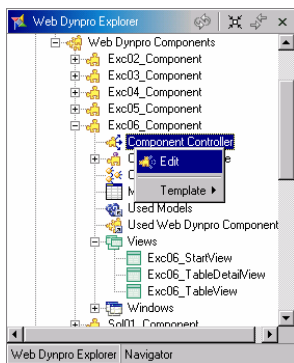
6 Optional: Additional table features, Step-by-Step

6-1 Show Details of a selected table row in a separate view.

6-1-1 Define data transport from *Exc06_TableView* to *Exc06_TableDetailView*.

To transport the person detail data between the two views, it is necessary to define the person structure in the component context and map this structure to the two view contexts.

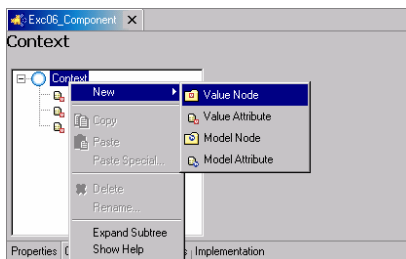
6-1-1-1 Define the component context value node *Person* for the component controller.



In the Web Dynpro Explorer:

Expand the nodes
WD01_Basics/Web Dynpro/Web Dynpro Components/Exc06_Component..

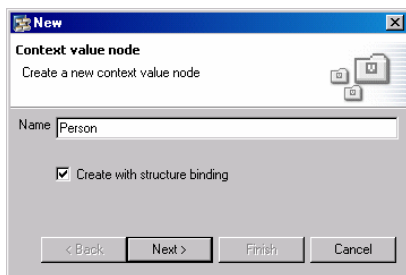
Open the context menu of *Component Controller* node.
Choose *Edit*.



The Controller editor appears on the right pane

Choose the *Context* tab

Open the context menu for the root node *Context* and choose the option *New/Value Node*

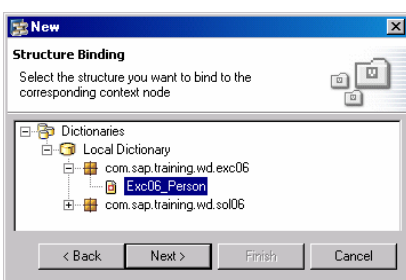


In the wizard, enter

Name: Person

Select "Create with structure binding"

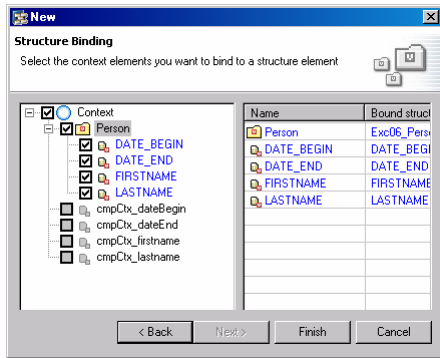
Choose *Next*.



Select structure

com.sap.training.wd.exc06.
Person

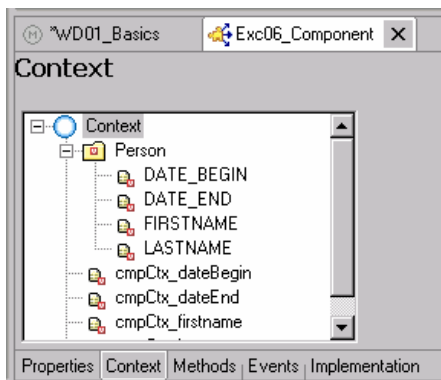
Choose *Next*.



Select the structure *person*.

Choose *Finish*.

Successful result:



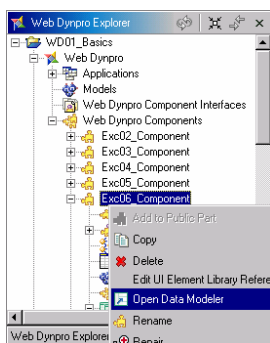
The component context includes the value node *person* and the value attributes *cmpCtx_dateBegin*, *cmpCtx_dateEnd*, *cmpCtx_firstname*, and *cmpCtx_lastname*.

Save the new project data by choosing *Save All Metadata* from the toolbar.

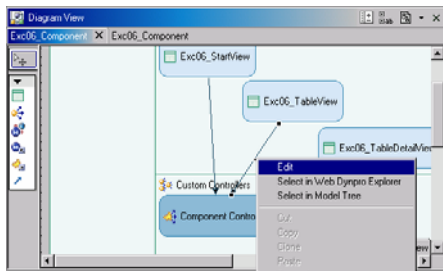
6-1-1-2 Define view context value node *Person* for view *Exc06_TableView*.
This has already been done in exercise 4-2-3.

6-1-1-3 Define view context value node *Person* for view *Exc06_TableDetailView*.
You find a description of the necessary steps in exercise 4-2-3.

6-1-1-4 Define the context mapping between the view context of *Exc06_TableView* and the component context.
This mapping has already been created in exercise 4-1-3.
In this exercise you have to update the data link.

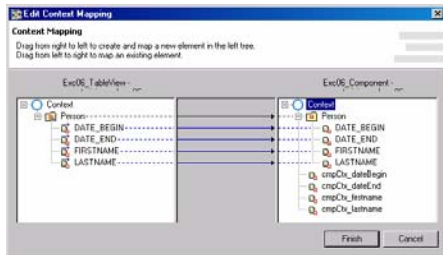


In the context menu of the node *WD01_Basics/Web Dynpro/Web Dynpro Components/Exc06_Component*, select the entry *Open Data Modeler*:



Choose the data link between *Exc06_TableView* and the component context.

From the context menu choose *Edit*.

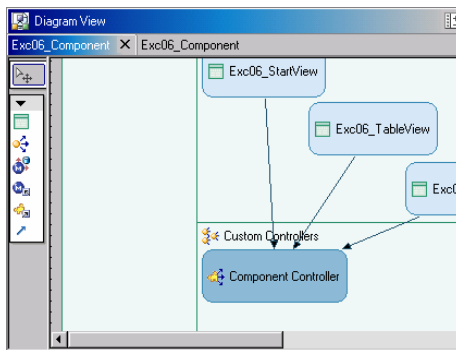


Drag and drop the value node *person* of the view context to the corresponding *person* node of the component controller and map the corresponding fields

To complete the data link definition, choose *Finish*.

Save the new project data by choosing *Save All Metadata* from the toolbar.

6-1-1-5 Define the context mapping between the view context of *Exc06_TableDetailView* and the component context.



Data Modeler, *Exc06_Component*:

In the left toolbar, choose *Create a data link*. This is then shaded in grey.

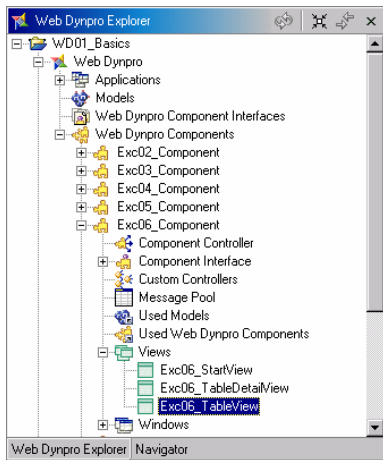
Place the cursor on *Exc06_TableDetailView* and left-click. Drag the data link to the *Component Controller* and release the left mouse button. The dialog box for defining the context mapping appears.

Drag and drop the value node *person* of the view context to the corresponding *person* node of the component controller.

To complete the data link definition, choose *Finish*.

Save the new project data by choosing *Save All Metadata* from the toolbar.

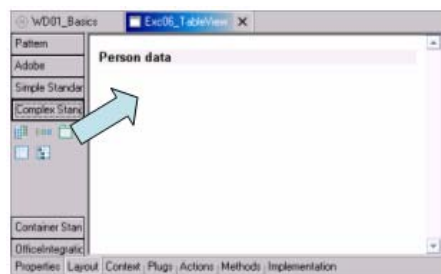
6-1-2 Add input fields to the detail view using templates.



In the Web Dynpro Explorer:

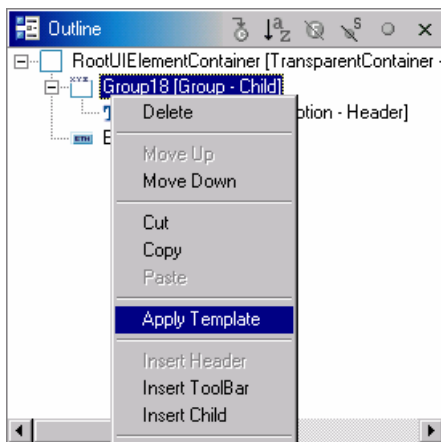
Expand the nodes
WD01_Basics/Web Dynpro/Web Dynpro Components/Exc06_Component..

Select the *Views* node. Open the context menu of *Exc06_TableDetailView*.
Choose *Edit*.



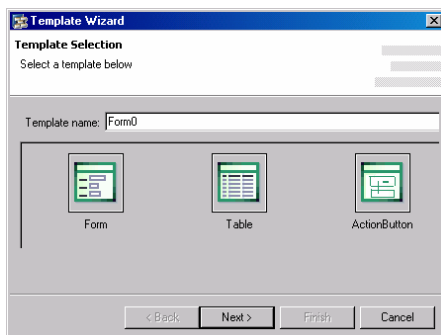
The View Designer for *Exc06_TableDetailView* appears on the right pane

Choose the Layout tab.



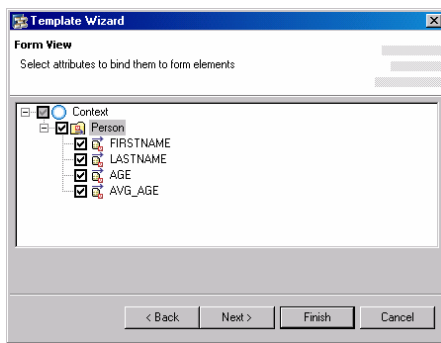
The Outline view appears in the lower left side of the SAP NetWeaver Developer Studio.

Choose the predefined *Group* node and choose *Apply Template* from the context menu.



In the wizard that appears, choose *Form*.

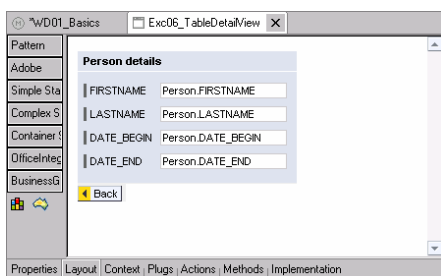
Choose *Next*.



In the next screen select all attributes from the structure *Person*.

Choose *Finish*.

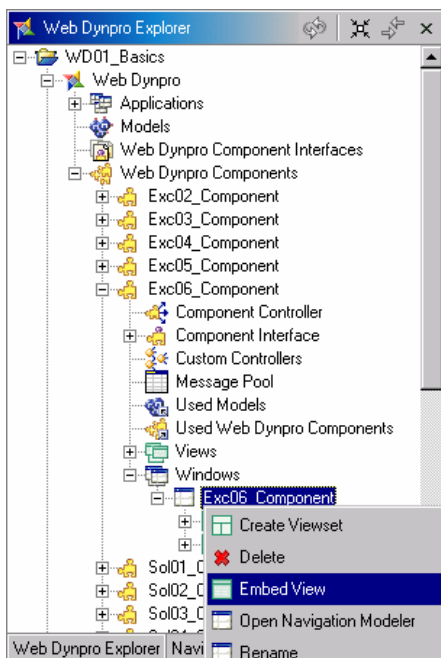
Successful result:



The wizard creates all necessary labels and input fields for *Exc06_TableDetailView*.

Save the new project data by choosing *Save All Metadata* from the toolbar.

6-1-3 Define navigation between *Exc06_TableView* and *Exc06_TableDetailView*



In the Web Dynpro Explorer:

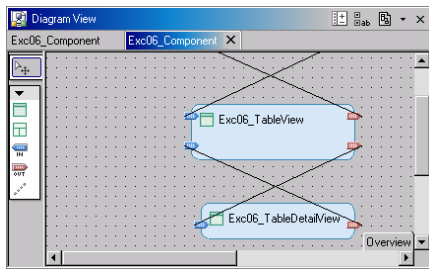
Expand the nodes
WD01_Basics/Web Dynpro/Web Dynpro Components/Exc06_Component..

Select the *Windows* node. Open the context menu of *Exc06_Component*.
Choose *Embed View*.

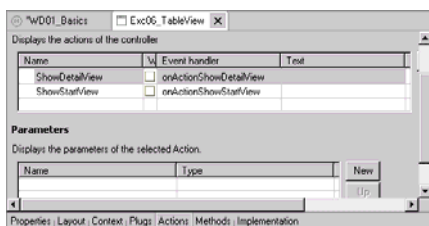
In the wizard that appears, choose *Embed existing view*.

Choose *Exc06_TableDetailView*

Choose *Finish*



Define navigation links
 from Outbound plug *toDetailView*
 to Inbound plug *fromTableView*
 from Outbound plug *toTableView*
 to Inbound plug *fromDetailView*



In *Exc06_TableView*

Choose the Action tab.
 Define a new Action *ShowTableView*
 (fires plug *toDetailView*).

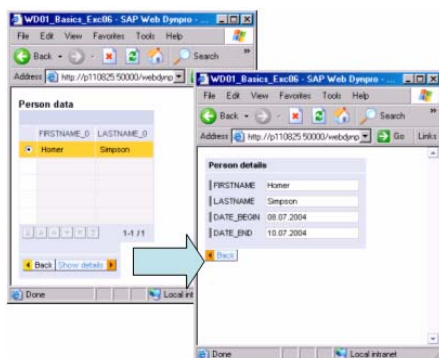
Choose the Layout tab.
 Add a button to the button group
 Choose the following properties:
 Text: *Details*
 Event: *onActionShowDetails*

Save the new project data by choosing *Save All Metadata* from the toolbar.

6-1-4 Create the Web Dynpro application *WD01_Basics_Exc06*.
 Have a look at exercise 4-5.

6-1-5 Build, deploy and run the application.
 Have a look at exercise 5-1.

Successful result:



As a result of this exercise, you added an additional view *Exc06_TableDetailView* to the component. When you select a table row and choose the Details button, the *Exc06_TableDetailView* appears and shows all details of the selected person.

6-2 Delete a selected table row.

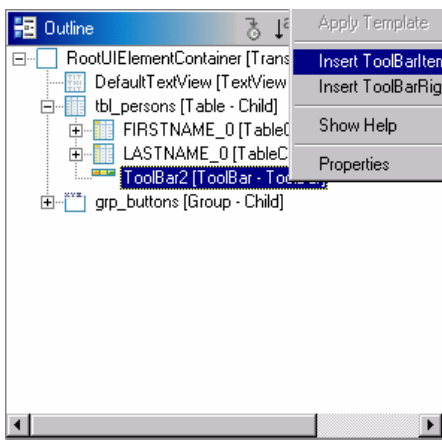
6-2-1 Define a toolbar and a toolbar button for the *Person* table in *Exc06_TableView*.

In the Web Dynpro Explorer: Expand the nodes *WD01_Basics/Web Dynpro/Web Dynpro Components/Exc06_Component..*

Select the *Views* node. Open the context menu of *Exc06_TableView*. Choose *Edit*.

The View Designer for *Exc06_TableView* appears on the right pane

Choose the Layout tab.



The Outline view appears in the lower left side of the SAP NetWeaver Developer Studio.

Select the *table* node. Open the context menu and choose *Insert Toolbar*.

Select the new *Toolbar* node. Open the context menu and choose *Insert Toolbaritem*.

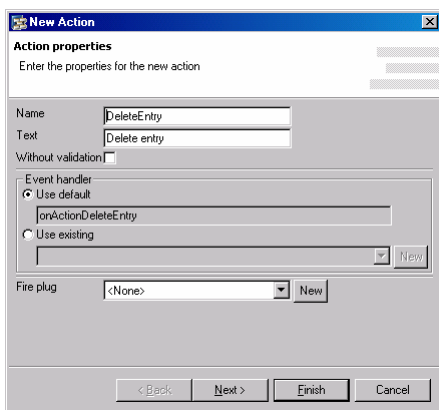
Choose type *ToolbarButton*

Choose *Finish*.

Save the new project data by choosing *Save All Metadata* from the toolbar.

6-2-2 Define an action for the toolbar button.

Choose the *Actions* tab of *Exc06_TableView*



Define a new Action

Name: *DeleteEntry*

Text: *Delete entry*

Event Handler: *Default*

Fire Plug: *<none>*

Choose *Finish*.

Save the new project data by choosing *Save All Metadata* from the toolbar.

6-2-3 Implement the event handler for deleting a person entry..

Choose the *Implementaion* tab of *Exc06_TableView*

Insert the following code in method *onActionDeletePerson(...)*

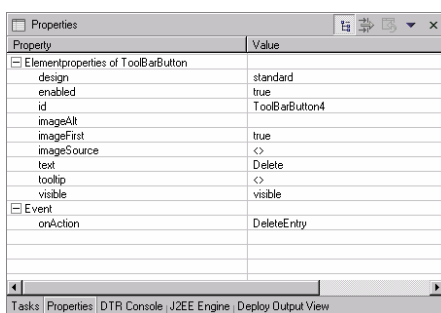
(For your convenience: You can cut and paste the code from the implementation of *Sol06_TableView*)

```
public void onActionDeleteEntry(com.sap.tc.webdynpro.  
    progmodel.api.IWDCustomEvent wdEvent ) {  
  
    //@@begin onActionDeleteEntry(ServerEvent)  
    int n = wdContext.nodePerson().size();  
    int leadSelected = wdContext.nodePerson().getLeadSelection();  
  
    // loop backwards to avoid index troubles  
    for (int i = n - 1; i >= 0; --i)  
    {  
        if (wdContext.nodePerson().isMultiSelected(i)  
            || leadSelected == i)  
        {  
            wdContext.nodePerson().removeElement(  
                wdContext.nodePerson().getElementAt(i));  
        } //if  
    } //for  
  
    //@@end  
}
```

Save the new project data by choosing *Save All Metadata* from the toolbar.

6-2-4 Assign the delete action to the delete button.

Choose the *Layout* tab of *Exc06_TableView*



Update the properties of the toolbar button.

text:

<>

At runtime this will be replaced by the text *Delete entry* that you have defined when you created the *DeleteEntry* action.

onAction *DeleteEntry*

Save the new project data by choosing *Save All Metadata* from the toolbar.

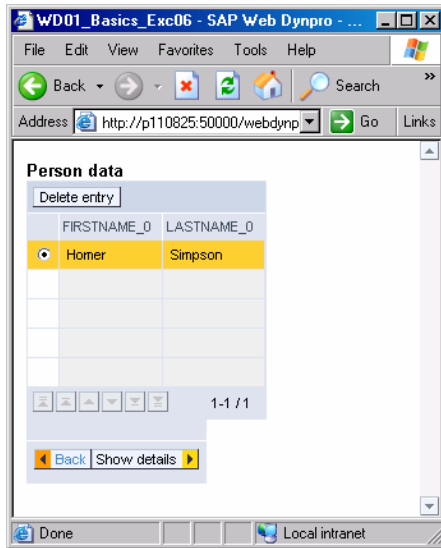
6-2-5 Create the Web Dynpro application *WD01_Basics_Exc06*.

Have a look at exercise 4-5.

6-2-6 Build, deploy and run the application.

Have a look at exercise 5-1.

Successful result:



As a result of this exercise, you added a *Delete* button to the table toolbar. When you select a table row and choose the *Delete* button, the table row will be deleted.

6-3 Calculated attributes

6-3-1 Update the *Person* structure, add an additional attribute *DURATION*

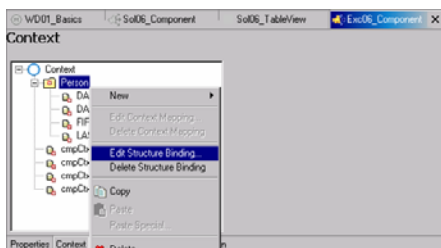
In the Web Dynpro Explorer, expand the nodes *WD01_Basics/Dictionary/Local Dictionary/Data Types/Structures..*
Select the *Exc06_Person* node, open the context menu and choose *Edit*.
The Structure editor appears on the right pane
Add the additional field *DURATION* of type *long*.

Save the new project data by choosing *Save All Metadata* from the toolbar.

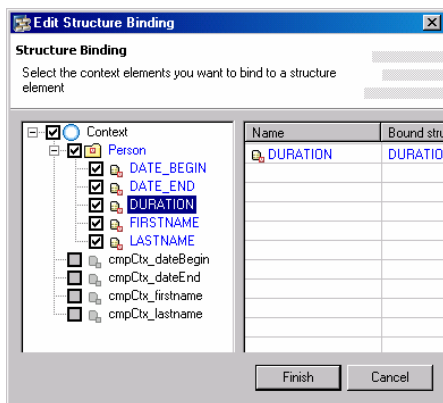
6-3-2 Update the component context.

6-3-2-1 Add the additional attribute *DURATION* from context *Person*

In the Web Dynpro Explorer, expand the nodes *WD01_Basics/Web Dynpro/Web Dynpro Components..*
Select the *Exc06_Components* node, open the context menu and choose *Edit*.

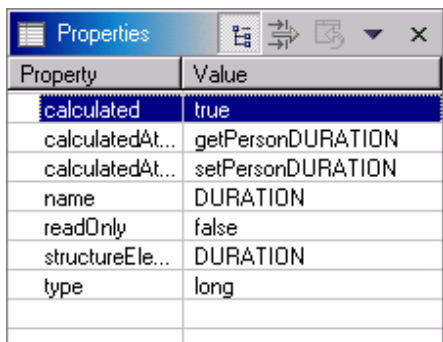


In the context editor that appears, choose the *Context* tab.
Choose the *Person* node, open the context menu and choose *Edit Structure Binding*.



In the wizard that appears choose **DURATION** and choose *Finish*

6-3-2-2 Set the *calculated* property of this attribute *true*



In the context editor choose the **DURATION** entry and change its property *calculated* to *true*,

Save the new project data by choosing *Save All Metadata* from the toolbar.

6-3-2-3 Implement the generated method *getPersonDURATION(...)*.

In the context editor choose the **IMPLEMENTATION** tab and navigate to method *getPersonDURATION(...)*:

```
package com.sap.training.wd.sol06;
//@@begin imports
import java.sql.Date;
import java.util.Calendar;
import java.util.GregorianCalendar;
//@@end

. . .

public long getPersonDURATION(
    IPrivateSol06_Component.IPersonElement element) {
    //@@begin
    Date dateBegin = element.getDATE_BEGIN();
    Date dateEnd   = element.getDATE_END();

    Calendar calBegin = new GregorianCalendar();
    calBegin.setTime(dateBegin);
    long dt1 = calBegin.getTimeInMillis();

    Calendar calEnd = new GregorianCalendar();
```

```

calEnd.setTime(dateEnd);
long dt2 = calEnd.getTimeInMillis();
long days = (dt2 - dt1) / 86400000;

return ++days;
//@@end
}

```

Save the new project data by choosing *Save All Metadata* from the toolbar.

6-3-3 Update the context of view *Exc06_TableView*.

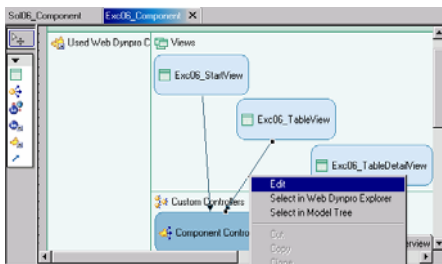
Add the additional attribute *DURATION* from context *Person* and map it to the component context.

Note: Since the view context has already been mapped to the component context that has a dictionary structure binding, you can not directly update the view context in the *Context* tab of the view editor.

In the Web Dynpro Explorer, expand the nodes

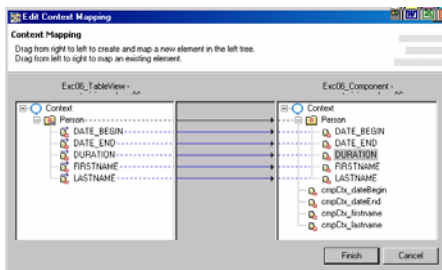
WD01_Basics/Web Dynpro/Web Dynpro Components.

Open the context of *Exc06_Components* and choose *Open Data Modeler*.



Choose the data link between *Exc06_TableView* and the component context.

From the context menu choose *Edit*.



In the right pane of the wizard that appears (component context) choose *DURATION* and drag and drop it to the *Person* entry on the left pane (view context)

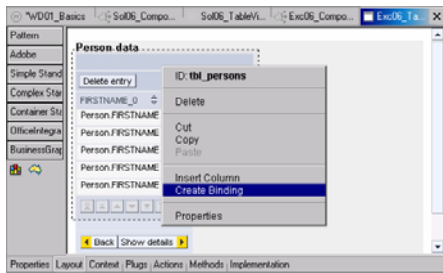
This will create a new attribute in the view context and map it to the component context.

Choose *Finish*

Save the new project data by choosing *Save All Metadata* from the toolbar.

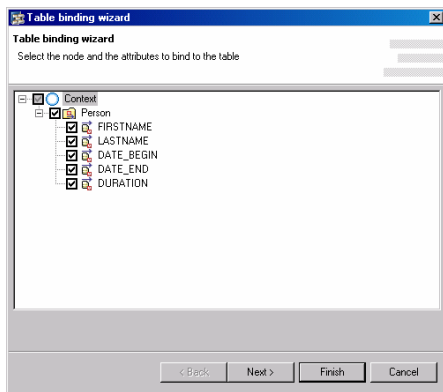
6-3-4 Update table *Person* on *Exc06_TableView*. Add the additional attributes *DATE_BEGIN*, *DATE_END*, and *DURATION* from structure *Person*.

In the Web Dynpro Explorer, expand the nodes *WD01_Basics/Web Dynpro/Web Dynpro Components/Views..*
Choose *Exc06_TableView*, open the context menu and choose *Edit*.



In the view editor that appears, choose the *Layout* tab.

Choose the *Person* table, open the context menu and choose *Create Binding*.



In the wizard that appears, choose *DATE_BEGIN*, *DATE_END*, and *DURATION*.

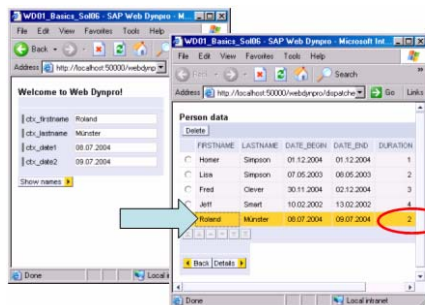
Choose *Finish*.

Save the new project data by choosing *Save All Metadata* from the toolbar.

6-3-5 Create the Web Dynpro application *WD01_Basics_Exc06*.
Have a look at exercise 4-5.

6-3-6 Build, deploy and run the application.
Have a look at exercise 5-1.

Successful result:



As a result of this exercise, you add an additional column *Duration* to the table. There is no input field for this column since the value of the column value is the difference between the start date and the end date and is calculated automatically.