C7. SQL Projection and Selection. Input SQL parameters from Web Page Items

As defined by relational algebra, the projection operator (π) – deletes unwanted columns from a relation R and discards duplicates. The selection operator (σ) – selects a subset of rows from R based on a selection condition. Both operators are implemented using SQL SELECT statement.

1.1. Projecting columns in SQL

The general syntax of projection operation in SQL is:

SELECT [ALL | DISTINCT] prj_list

FROM table;

The projection list (prj_list) is a comma-separated list of fields from the table. As an alternative it can be replaced by the sign '*' to obtain 1:1 projection. In this case the name and order of the result fields will be the same as in original table. Fields can be renamed using the AS keyword.

The DISTINCT keyword force duplicates elimination. Default is ALL.

ACTIVITY 1: Using SQL Workshop -> SQL Commands run the following SQL commands:

SELECT id AS PersonID, name FROM Persons;

SELECT DISTINCT name FROM Persons;

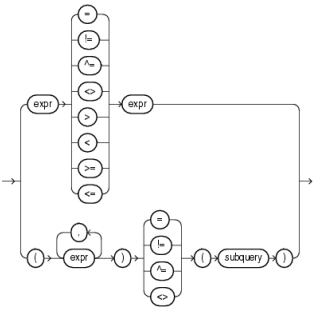
SELECT * FROM Persons;

1.2. Selecting rows in SQL

The general syntax of selection operation in SQL is:

```
SELECT prj_list
        FROM table
        WHERE select_condition;
```

For pure selection (without projection) the marker '*' have to be used as prj_list value. The select_condition is a general logical expression involving table fields, constants, injected variables, comparison operators (=, <, >, <=, >=, <>) and logical operators (AND, OR, NOT). Moreover, it can contain some SQL functions that are system specific.



Oracle supports also pattern searching using the LIKE operator. The wildcards in this case are '_' to replace a single character and '%' to replace a sequence of 0 to N characters.

ACTIVITY 2: Using SQL Workshop -> SQL Commands run the following SQL commands:

```
SELECT * FROM Persons WHERE dep_id=1;

SELECT * FROM Persons
    WHERE name LIKE 'J%' AND dep_id=1;
```

1.3. Input SQL parameters from Web Page Items

APEX uses HTTP POST requests to send user data read from page items. It implements an SQL injection mechanism to pass corresponding POST variables to SQL interpreter. The syntax used in this case includes a colon sign ':' as prefix of the POST variable. The variable name is the same as the APEX item name.

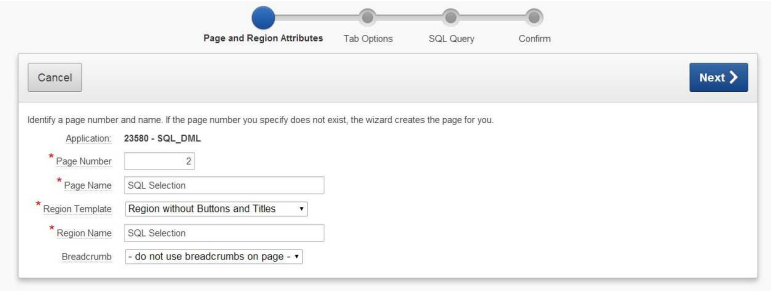
ACTIVITY 3: Create an interactive report on Persons table. The report will filter data using SQL select mechanism based on a dep_id value read from the user. For reading the user input add an input field and a validation button.

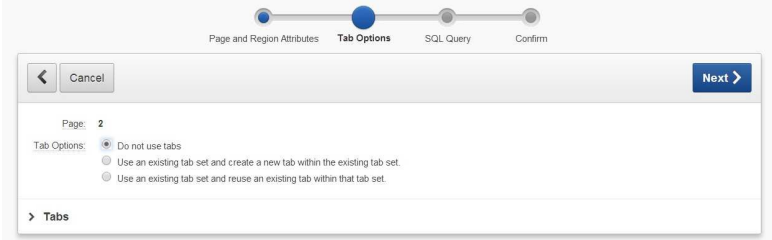
- Step 1

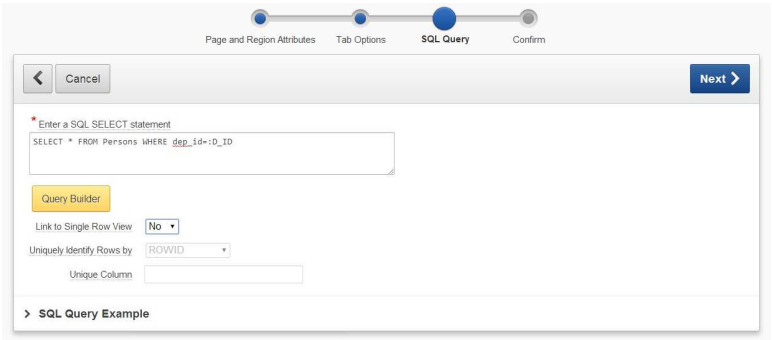
From Application Builder -> Create add a new application named SQL_DML.

- Step 2

Add a new page for the SQL_DML application using the Create Page button. Choose the Interactive Report and follow the steps illustrated bellow:

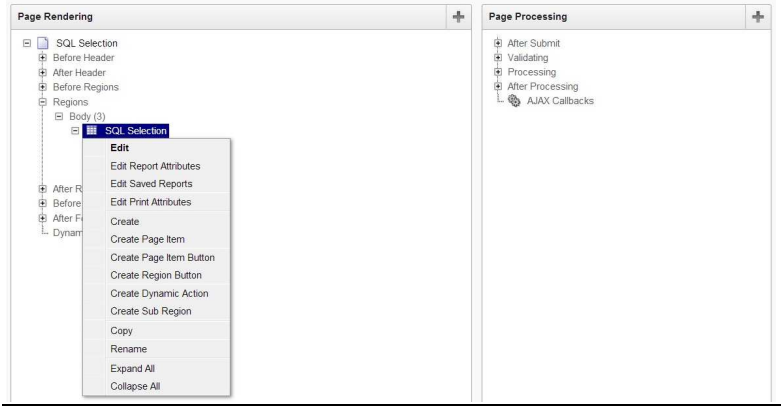


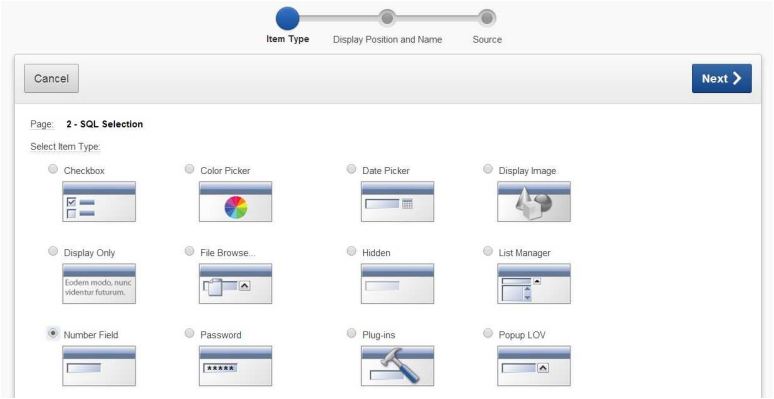


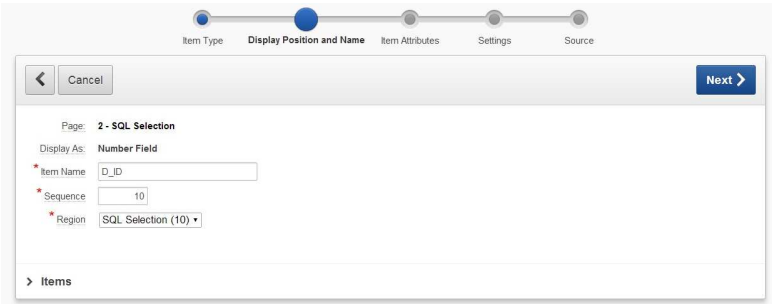


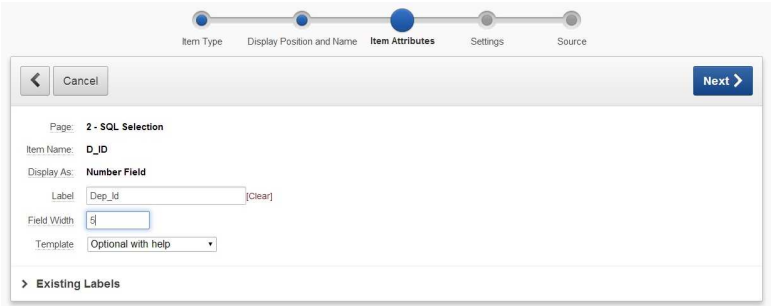
- Step 3

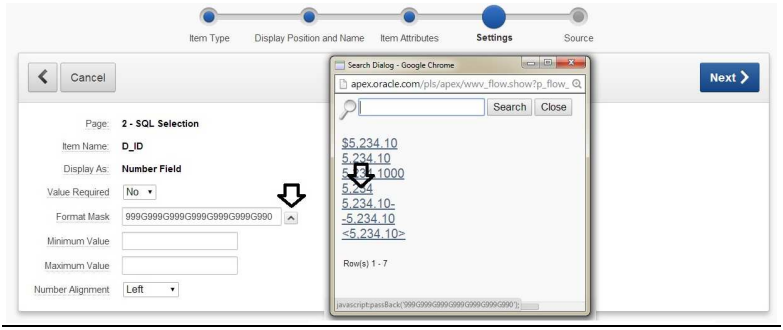
Edit the report page. Add a new number input field from the Create Page Item context menu of the report item (named here 'SQL Selection'). Give the name D_ID to this input, as presented below:

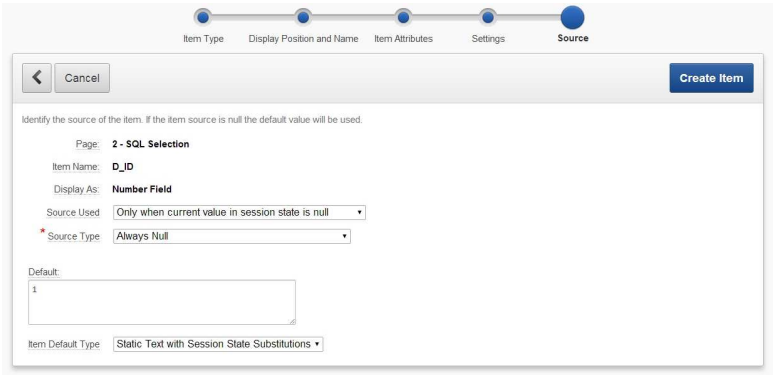



Item Type
Display Position and Name
Source
Cancel
Next
Page: 2 - SQL Selection
Select Item Type:
Checkbox
Color Picker
Date Picker
Display Image
Display Only
Eodem modo, nunc videntur futurum.
File Browse...
Hidden
List Manager
Number Field
Password
Plug-ins
Popup LOV


Item Type
Display Position and Name
Item Attributes
Settings
Source
Cancel
Next
Page: 2 - SQL Selection
Display As: Number Field
* Item Name D_ID
* Sequence 10
* Region SQL Selection (10)
Items

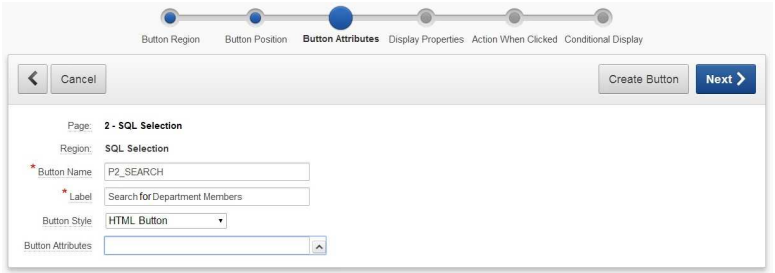

Item Type
Display Position and Name
Item Attributes
Settings
Source
Cancel
Next
Page: 2 - SQL Selection
Item Name: D_ID
Display As: Number Field
Label Dep_Id [Clear]
Field Width 5
Template Optional with help
Existing Labels

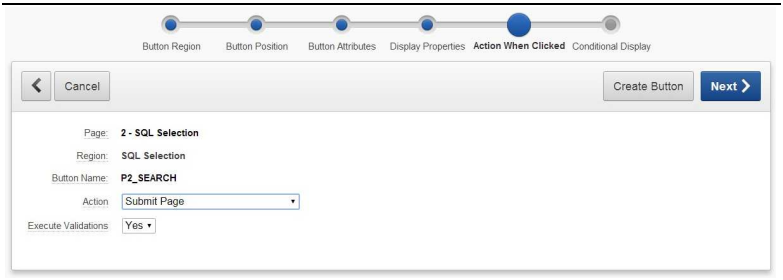


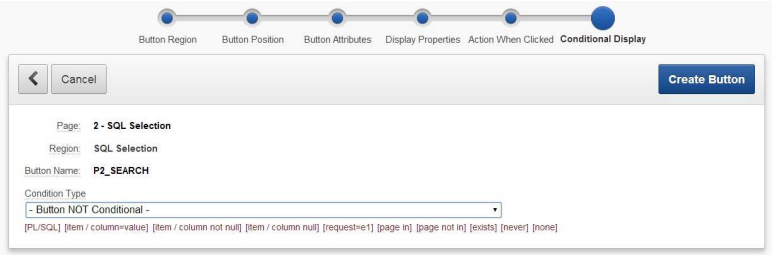


- Step 4

Edit the report page. Add a new Button from the Create Page Item Button context menu of the report item (named here 'SQL Selection'). Give the name P2_SEARCH to this button, as presented below:







- Step 5

Run the report page and test the user input.