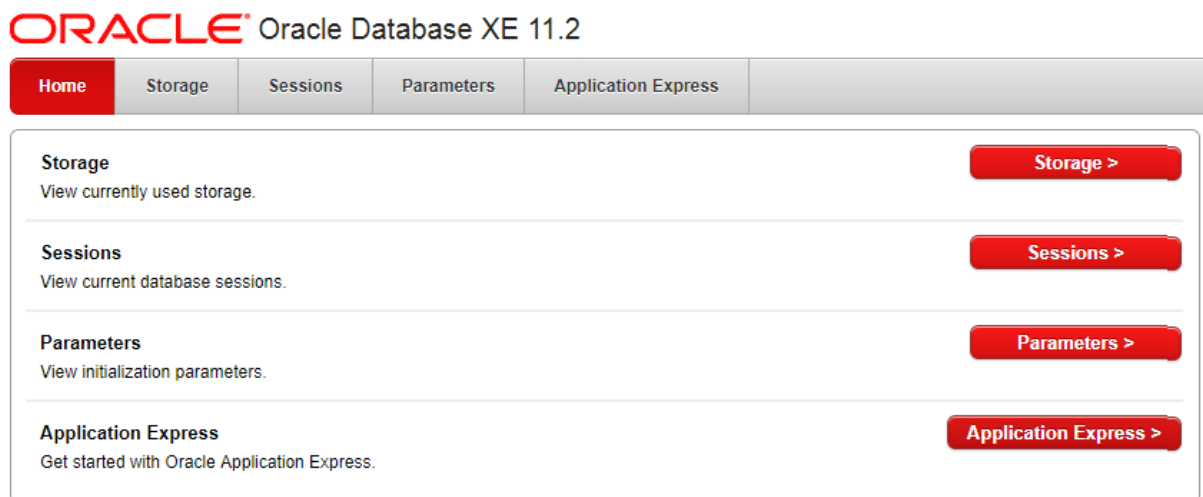


Laboratory work

Purpose of work: Creating a web application for working with a database using Oracle Application Express.

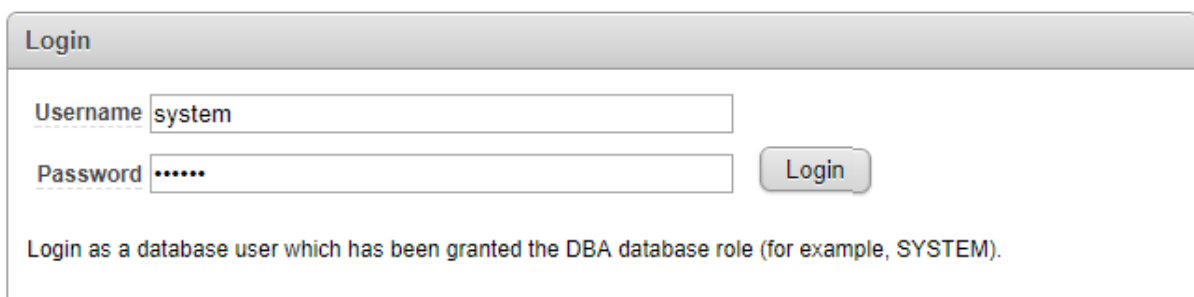
Completing of the work.

1. Launch Oracle Database XE, follow the Application Express link (Figure 1).



Picture 1

2. Enter the username and password specified during installation and click the Login button (Figure 2).

The screenshot shows the Oracle Database XE 11.2 Login page. It has a title bar 'Login'. Below the title bar, there are two input fields: 'Username' with the value 'system' and 'Password' with masked characters '.....'. To the right of the password field is a 'Login' button. Below the input fields, there is a text line: 'Login as a database user which has been granted the DBA database role (for example, SYSTEM)'.

Picture 2

3. Create a new database user Database User: Create New, enter supplyapp in the username and password fields and click the Create Workspace button (Figure 3).

Figure 3

4. After the user is created, follow the link click here (Figure 4).

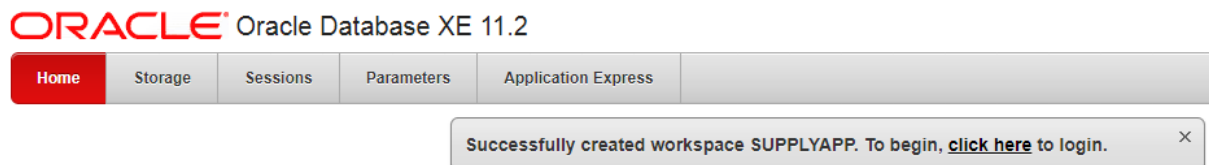


Figure 4

5. Enter the password for supplyapp and click the Login button (Figure 5).



ORACLE® Application Express

Enter Application Express workspace and credentials.

Workspace: SUPPLYAPP

Username: SUPPLYAPP

Password:

Login

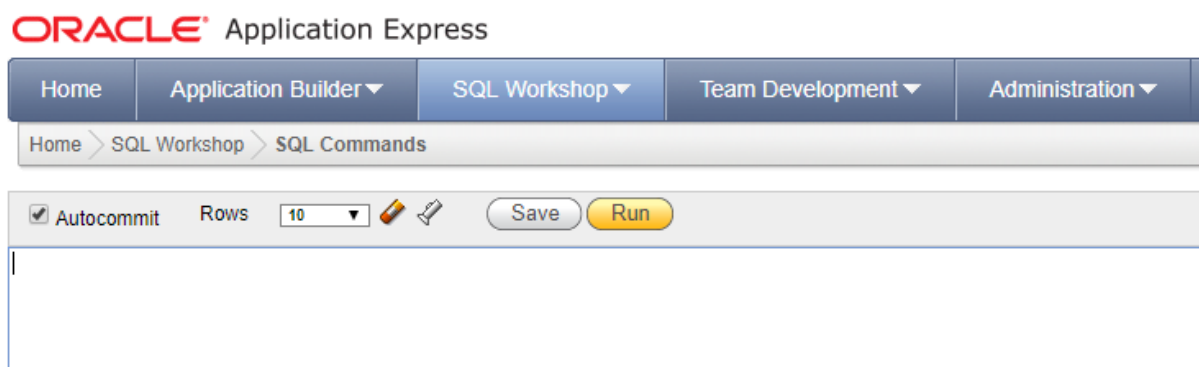
[Click here to learn how to get started](#)

Oracle Application Express is a rapid Web application development tool that lets you share data and create custom applications. Using only a Web browser and limited programming experience, you can develop and deploy powerful applications that are both fast and secure.

Language: English, Português (Brasil), 中文 (简体), 日本語

Figure 5

6. Go to the SQL Workshop tab, select SQL Commands. To execute the DDL command, press the Run button (Figure 6).



ORACLE® Application Express

Home Application Builder SQL Workshop Team Development Administration

Home > SQL Workshop > SQL Commands

☒ Autocommit Rows 10 Save Run

Figure 6

7. Run the following commands to create database tables:

```
CREATE TABLE CONTRACTS
(
    CONTRACT_NUMBER NUMBER NOT NULL,
    CONTRACT_DATE DATE NOT NULL,
    SUPPLIER_CODE NUMBER NOT NULL,
    CONTRACT_NOTE NCHAR (50) NULL
);

CREATE UNIQUE INDEX XPKCONTRACTS ON CONTRACTS
```

```

(CONTRACT_NUMBER ASC);

ALTER TABLE CONTRACTS
    ADD CONSTRAINT XPKCONTRACTS PRIMARY KEY (CONTRACT_NUMBER);

CREATE TABLE DELIVERIES
(
    CONTRACT_NUMBER NUMBER NOT NULL,
    PRODUCT_CODE NUMBER NOT NULL,
    PRODUCT_AMOUNT NUMBER (5,0) NOT NULL,
    PRODUCT_COST NUMBER (8,2) NOT NULL
);

CREATE UNIQUE INDEX XPKDELIVERIES ON DELIVERIES
(CONTRACT_NUMBER ASC, PRODUCT_CODE ASC);

ALTER TABLE DELIVERIES
    ADD CONSTRAINT XPKDELIVERIES PRIMARY KEY (CONTRACT_NUMBER, PRODUCT_CODE);

CREATE TABLE PRODUCTS
(
    PRODUCT_CODE NUMBER NOT NULL,
    PRODUCT_NAME NCHAR (30) NOT NULL,
    PRODUCT_CATEGORY NCHAR (30) NOT NULL
);

CREATE UNIQUE INDEX XPKPRODUCTS ON PRODUCTS
(PRODUCT_CODE ASC);

ALTER TABLE PRODUCTS
    ADD CONSTRAINT XPKPRODUCTS PRIMARY KEY (PRODUCT_CODE);

CREATE TABLE SUPPLIERS
(
    SUPPLIER_CODE NUMBER NOT NULL,
    SUPPLIER_NAME NCHAR (30) NOT NULL,
    SUPPLIER_ADDRESS NCHAR (50) NOT NULL,
    SUPPLIER_PHONE NCHAR (12) NOT NULL,
    SUPPLIER_EMAIL NCHAR (30) NULL,
    SUPPLIER_BANK_CODE NCHAR (6) NOT NULL,
    SUPPLIER_BANK_ACCOUNT NCHAR (16) NOT NULL
);

CREATE UNIQUE INDEX XPKSUPPLIERS ON SUPPLIERS
(SUPPLIER_CODE ASC);

ALTER TABLE SUPPLIERS
    ADD CONSTRAINT XPKSUPPLIERS PRIMARY KEY (SUPPLIER_CODE);

ALTER TABLE CONTRACTS
    ADD (CONSTRAINT R_1 FOREIGN KEY (SUPPLIER_CODE) REFERENCES SUPPLIERS
(SUPPLIER_CODE));

ALTER TABLE DELIVERIES
    ADD (CONSTRAINT R_2 FOREIGN KEY (CONTRACT_NUMBER) REFERENCES CONTRACTS
(CONTRACT_NUMBER));

ALTER TABLE DELIVERIES
    ADD (CONSTRAINT R_3 FOREIGN KEY (PRODUCT_CODE) REFERENCES PRODUCTS
(PRODUCT_CODE));

```

8. Go to the Object Browser, select the DELIVERIES table, go to the Constraints tab (Figure 7).

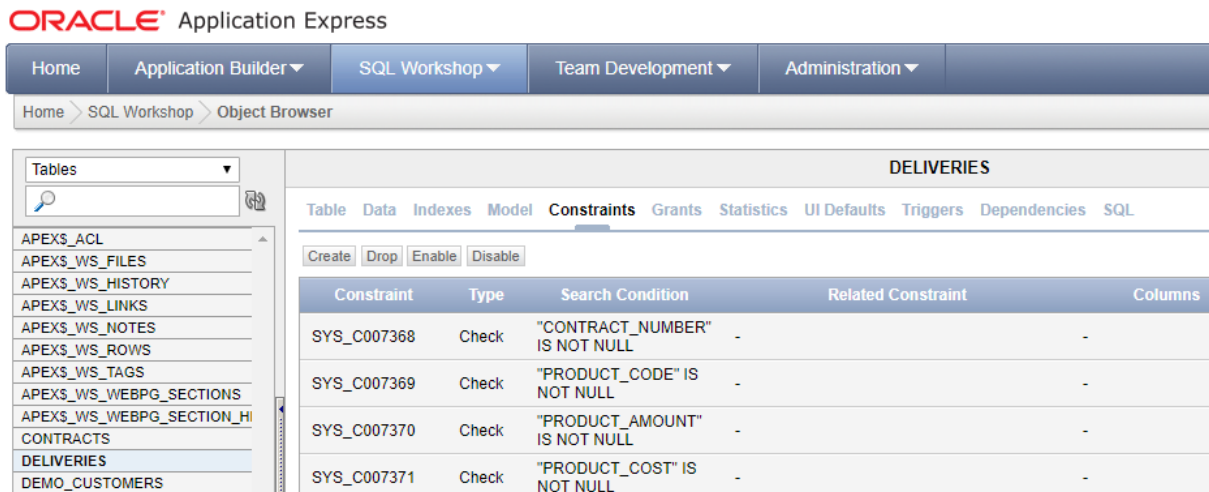


Figure 7

9. Click the Create button, select the PRODUCT_AMOUNT column, enter > 0 in the Constraint Expression field, click the Next button and then the Finish button (Figure 8).

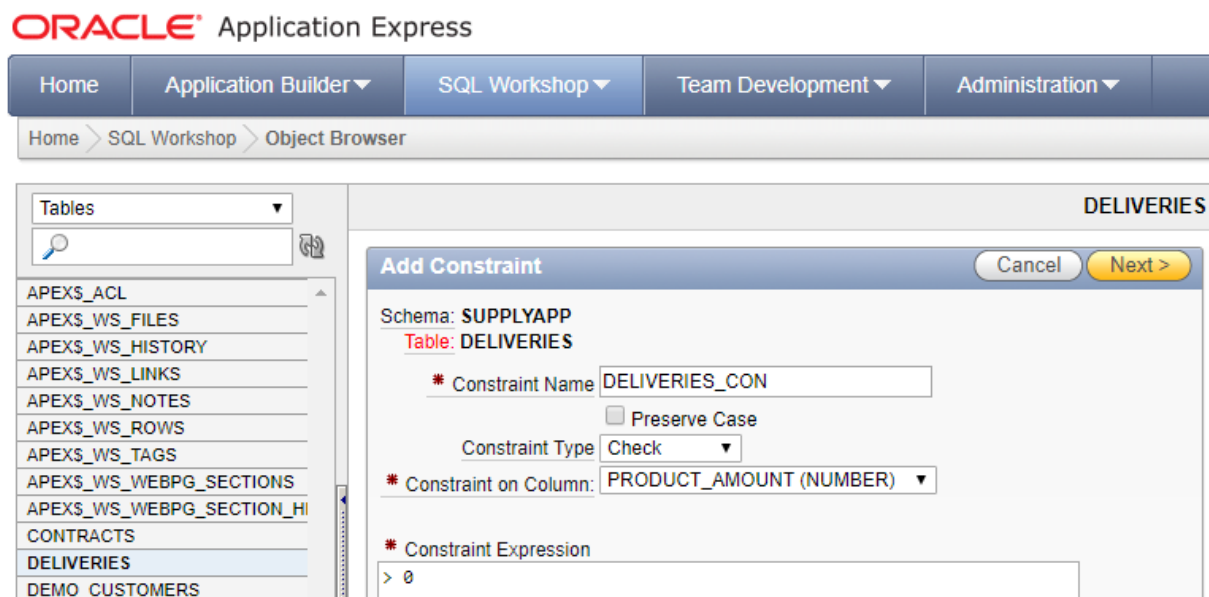


Figure 8

10. Create a constraint for the PRODUCT_COST column in the same way.

11. Go to the Application Builder tab and click the Create button (Figure 9).

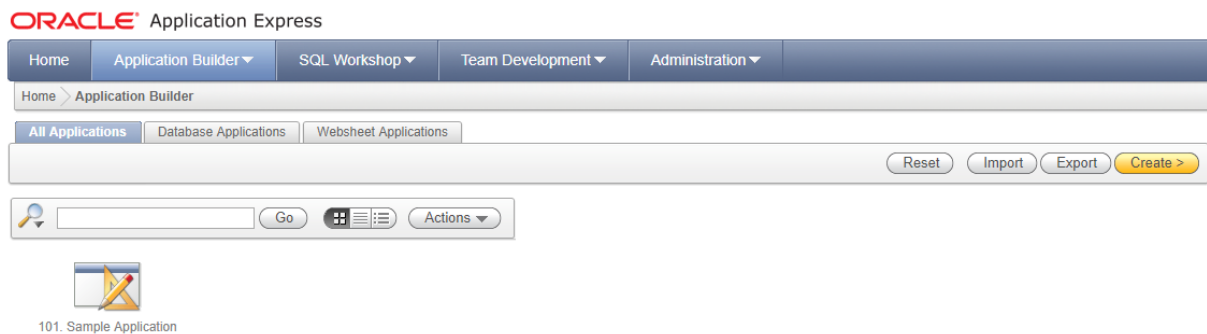


Figure 9

12. Select the Database application type and click Next (Figure 10).

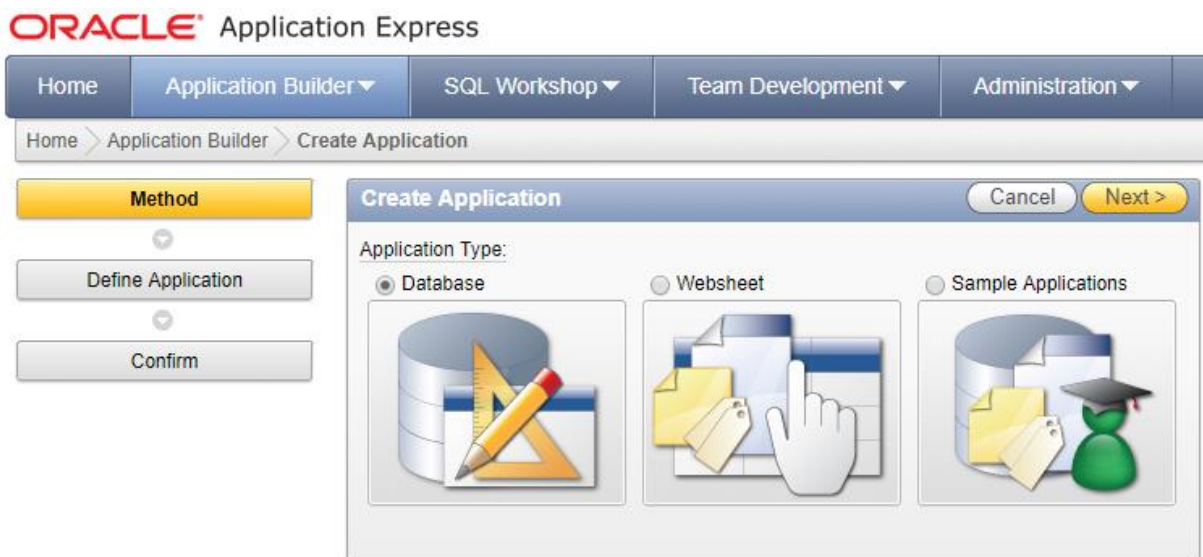


Figure 10

13. Select From Scratch and click Next (Figure 11).

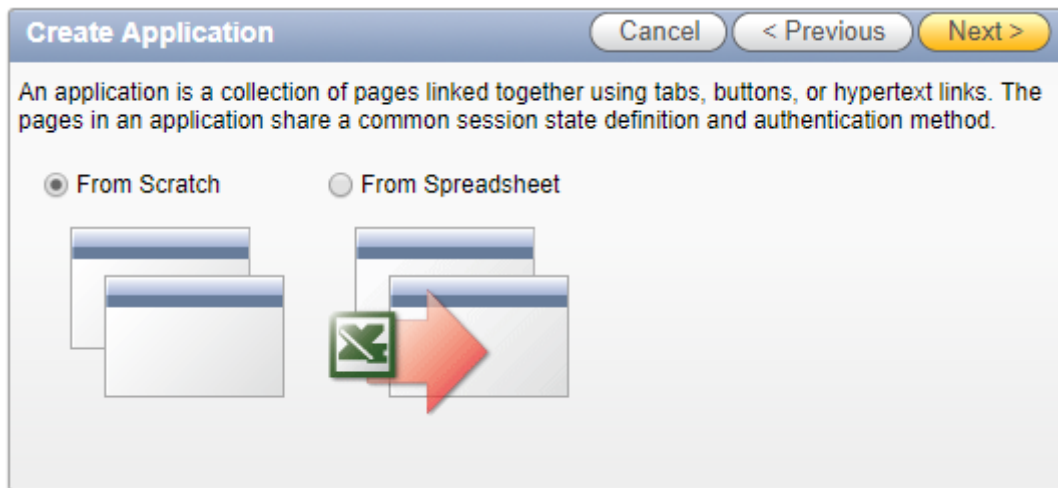


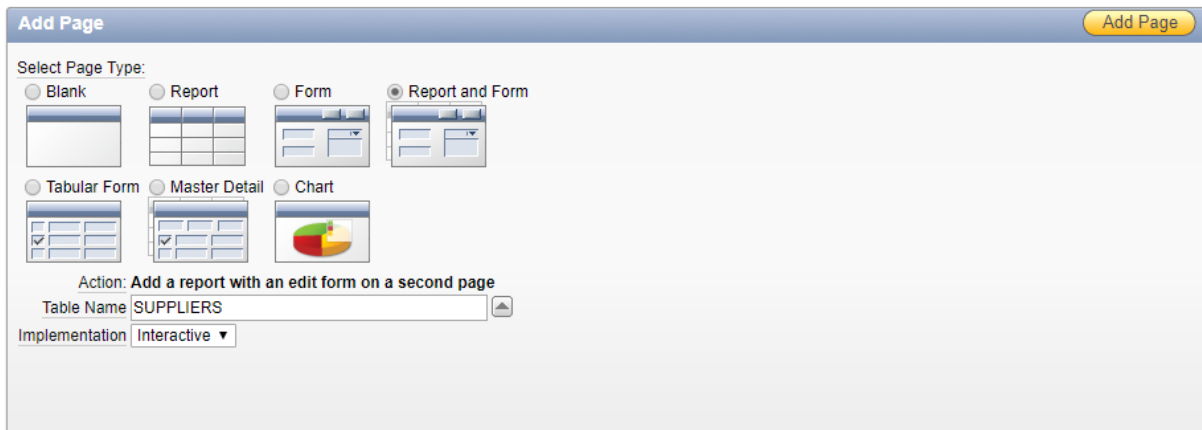
Figure 11

14. Enter the name of the SUPPLYAPP application and click the Next button (Figure 12).

The image shows the 'Create Application' dialog box with the following fields filled out: 'Name' is 'SUPPLYAPP', 'Application' is '103', 'Create Application:' has 'From scratch' selected, and 'Schema' is 'SUPPLYAPP'. The 'Next >' button is highlighted in yellow. The text at the top of the dialog box reads: 'Enter an application name and an unique application ID. Then, select an application creation method and a schema.'

Figure 12

15. Select the Report and Form page type, select the SUPPLIERS table and click the Add Page button (Figure 13).



Add Page Add Page

Select Page Type:

☐ Blank
 ☐ Report
 ☐ Form
 ☒ Report and Form

☐ Tabular Form
 ☐ Master Detail
 ☐ Chart

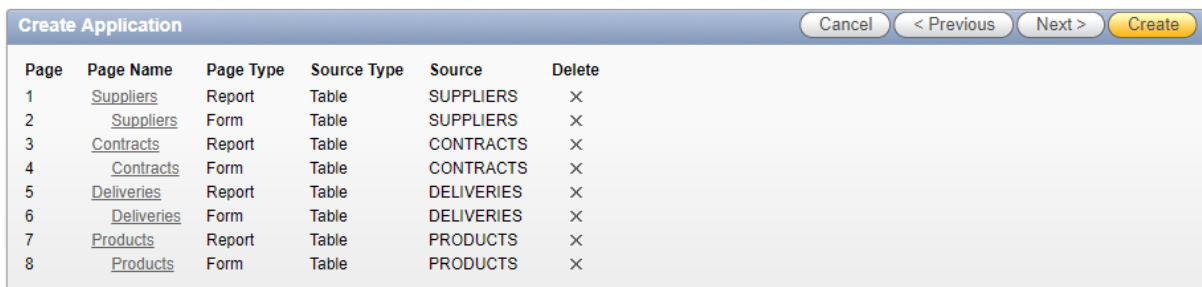
Action: Add a report with an edit form on a second page

Table Name:

Implementation:

Figure 13

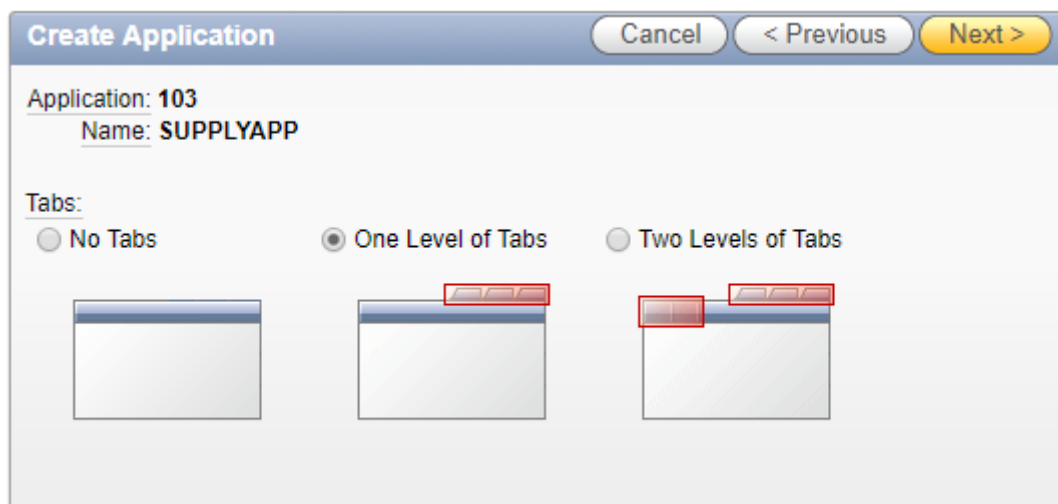
16. Create pages for the CONTRACTS, DELIVERIES and PRODUCTS tables in the same way. Click the Next button (Figure 14).



Page	Page Name	Page Type	Source Type	Source	Delete
1	Suppliers	Report	Table	SUPPLIERS	×
2	Suppliers	Form	Table	SUPPLIERS	×
3	Contracts	Report	Table	CONTRACTS	×
4	Contracts	Form	Table	CONTRACTS	×
5	Deliveries	Report	Table	DELIVERIES	×
6	Deliveries	Form	Table	DELIVERIES	×
7	Products	Report	Table	PRODUCTS	×
8	Products	Form	Table	PRODUCTS	×

Figure 14

17. Select One Level of Tabs and click Next (Figure 15).



Create Application Cancel < Previous Next > Create

Application: 103
Name: SUPPLYAPP

Tabs:

☐ No Tabs
 ☒ One Level of Tabs
 ☐ Two Levels of Tabs

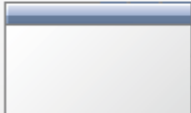
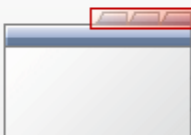

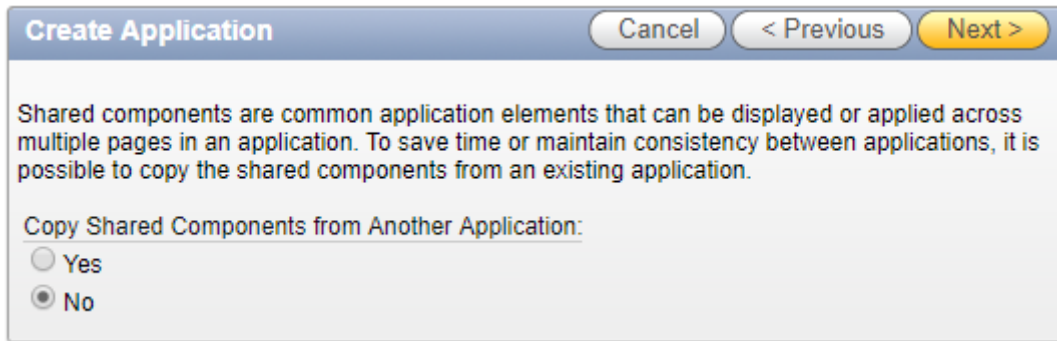




Figure 15

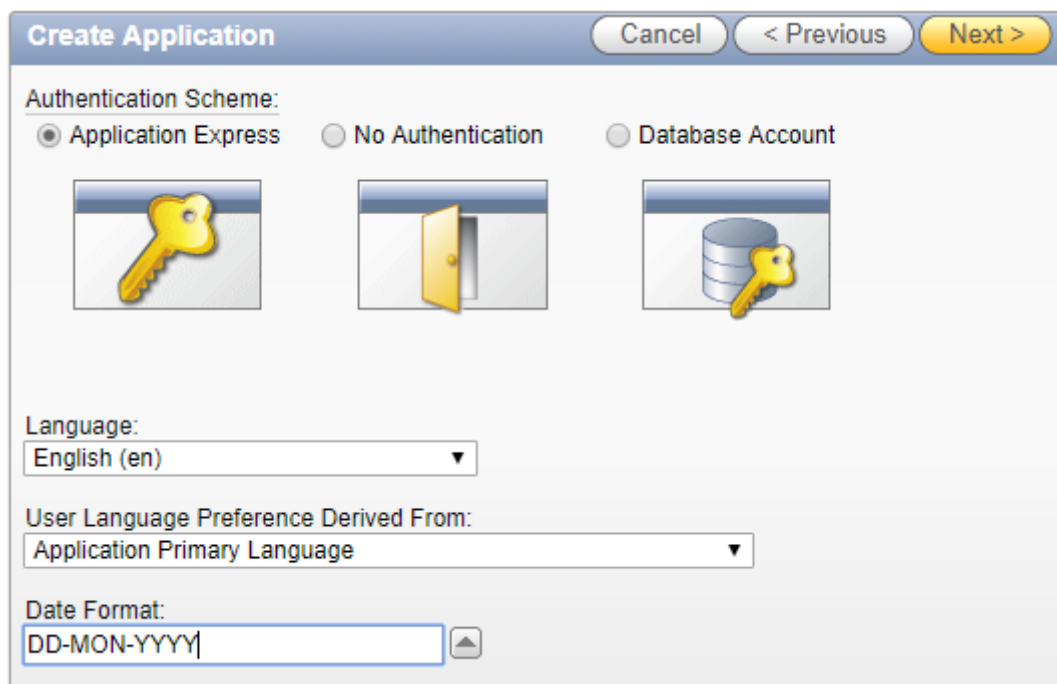
18. Select No and click Next (Figure 16).



The dialog box is titled "Create Application". It has three buttons at the top: "Cancel", "< Previous", and "Next >". The main text reads: "Shared components are common application elements that can be displayed or applied across multiple pages in an application. To save time or maintain consistency between applications, it is possible to copy the shared components from an existing application." Below this, it says "Copy Shared Components from Another Application:" followed by two radio buttons: "Yes" and "No". The "No" radio button is selected.

Figure 16

19. Select the date format DD-MON-YYYY and click Next (Figure 17).



The dialog box is titled "Create Application". It has three buttons at the top: "Cancel", "< Previous", and "Next >". The "Authentication Scheme:" section has three radio buttons: "Application Express" (selected), "No Authentication", and "Database Account". Below each radio button is an icon: a yellow key for "Application Express", an open yellow door for "No Authentication", and a database cylinder with a yellow key for "Database Account". The "Language:" dropdown menu is set to "English (en)". The "User Language Preference Derived From:" dropdown menu is set to "Application Primary Language". The "Date Format:" text box contains "DD-MON-YYYY" and has a small icon to its right.

Figure 17

20. Leave the default theme (Theme 21) and click Next (Figure 18).

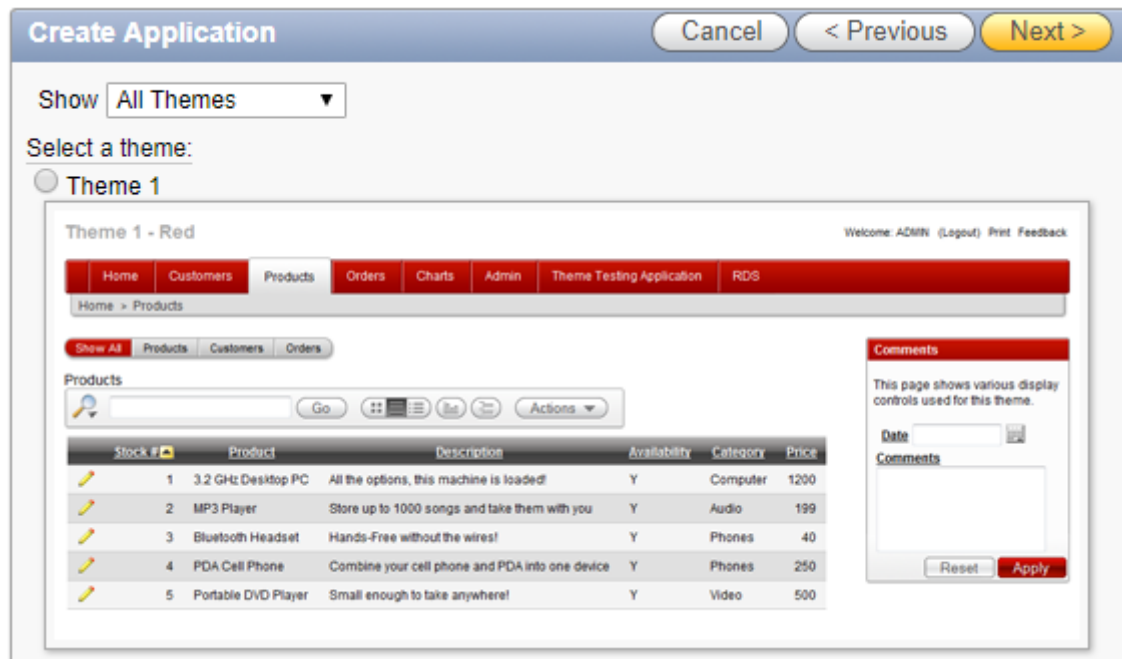


Figure 18

21. The creation of the application is completed, click the Create button (Figure 19).

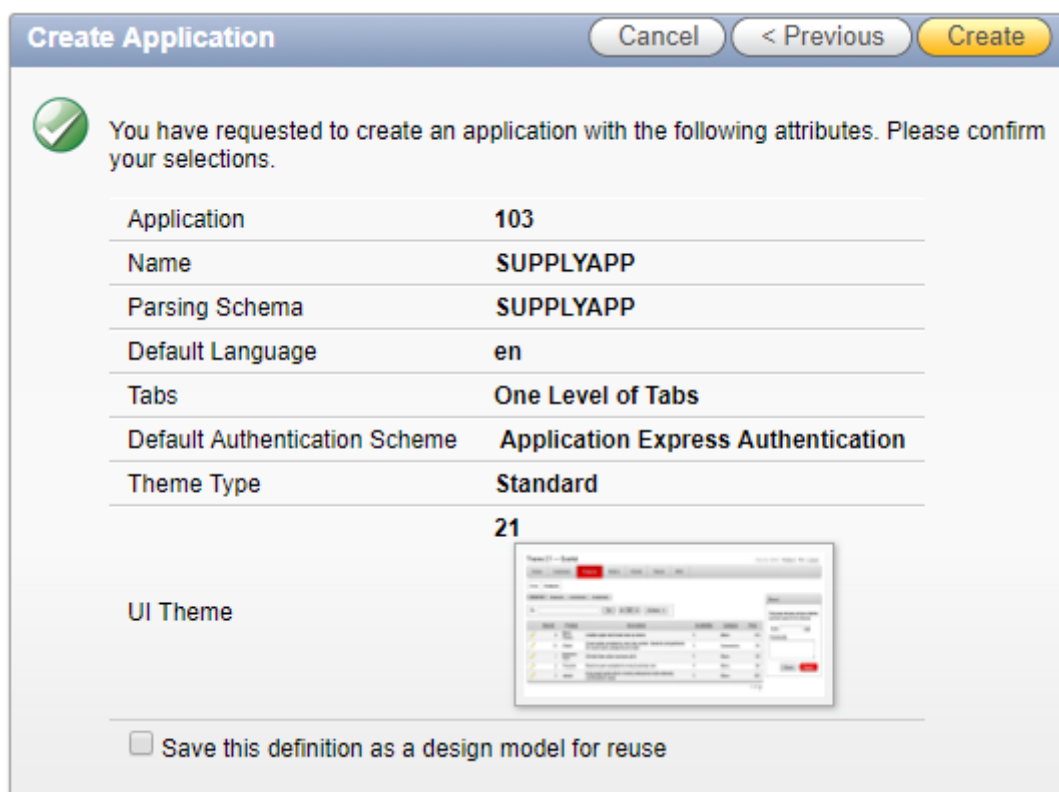


Figure 19

22. Go to editing page 2 - Suppliers (Figure 20).

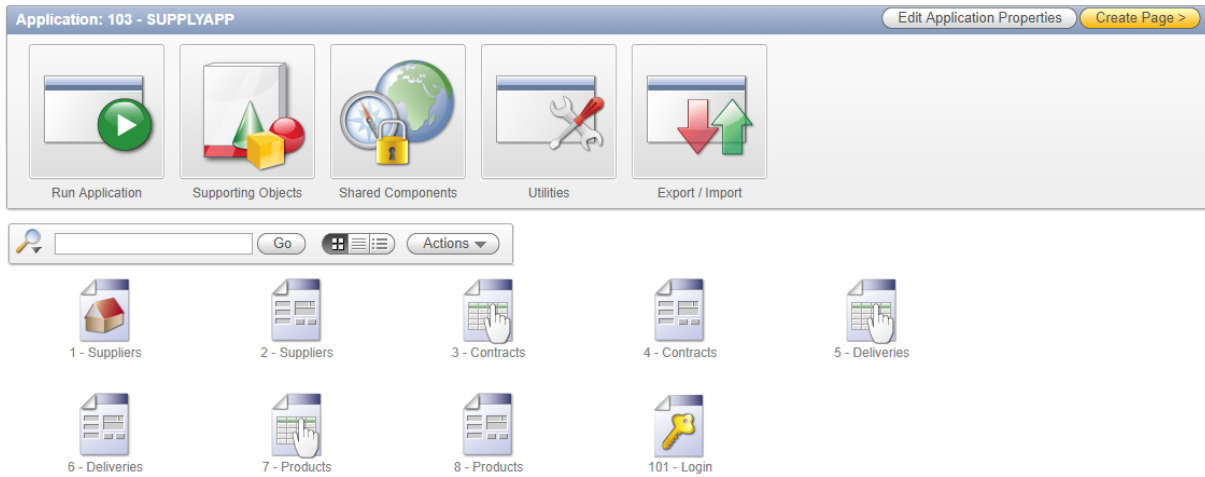


Figure 20

23. Go to editing the P2_SUPPLIER_CODE field (Figure 21).

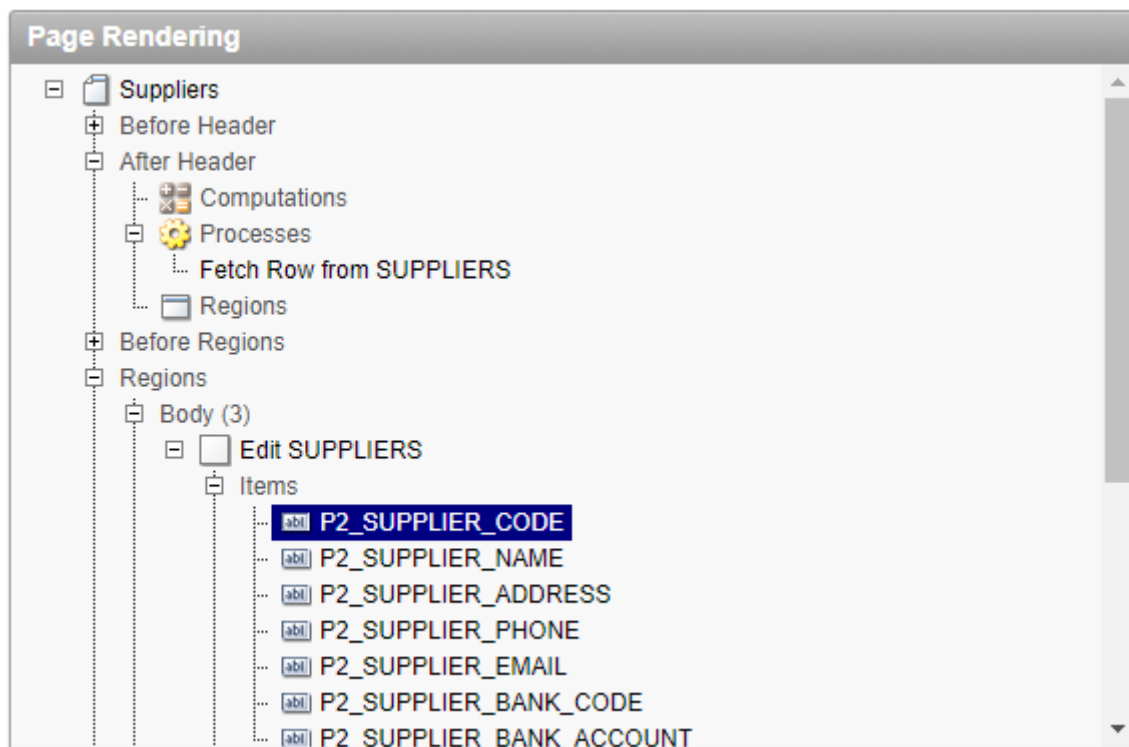


Figure 21

24. Instead of Hidden in the Display As drop-down list, select Text Field and click the Apply Changes button (Figure 22).

Page Item: P2_SUPPLIER_CODE

Cancel Delete Apply Changes

Show All Name Displayed Label Settings Element Source Default Quick Picks Conditions Read Only Security Configuration Help Text Comments

Name

Page: 2 Suppliers

Name P2_SUPPLIER_CODE

Display As Text Field

Text , Number , Date , Textarea , Select List , Radio , Popup List of Values , Checkbox , Display Only , Hidden

Figure 22

25. Edit the following fields in the same way:

- 1) P4_CONTRACT_NUMBER on page 4 - Contracts;
- 2) P6_CONTRACT_NUMBER and P6_PRODUCT_CODE on page 6 - Deliveries;
- 3) P8_PRODUCT_CODE on page 8 - Products.

26. Run the application by clicking Run Application (Figure 20).

27. On the Suppliers tab, click the Create button and enter information about the supplier (Figure 23).

Suppliers Contracts Deliveries Products

Suppliers

Q- Go Actions Create

Supplier Code	Supplier Name	Supplier Address	Supplier Phone	Supplier Email	Supplier Bank Code	Supplier Bank Account
4	ЗАО "Транссервис"	г. Одесса, ул. Дерибасовская, 75	380123456789	zaotrans@example.com	123456	1234567898765432

Figure 23

28. On the Contracts tab, click the Create button and enter information about the contract with the supplier (Figure 24).

Suppliers
Contracts
Deliveries
Products

Contracts

Q-
Go
Actions ▼
Create


	<u>Contract Number</u>	<u>Contract Date</u>	<u>Supplier Code</u>	<u>Contract Note</u>
	123456	15-NOV-2017	4	Основание - накладная №34 от 30/10/17

Figure 24

29. On the Products tab, click the Create button and enter information about the products (Figure 25).

Suppliers
Contracts
Deliveries
Products

Products

Q-
Go
Actions ▼
Create



	<u>Product Code</u>	<u>Product Name</u>	<u>Product Category</u>
	111112	Компьютер	Оргтехника
	111116	Телевизор	Бытовая техника

Figure 25

30. On the Deliveries tab, click the Create button and enter information about the goods (Figure 26).

Suppliers	Contracts	Deliveries	Products	
-----------	-----------	-------------------	----------	--

Deliveries

	<u>Contract Number</u>	<u>Product Code</u>	<u>Product Amount</u>	<u>Product Cost</u>
	123456	111112	43	145318.99
	123456	111116	62	90058.01

Figure 26

Self-study assignments:

1. In the information on contracts with suppliers, presented on the Contracts tab, the Supplier Code is indicated (Figure 24), which is not convenient enough from the point of view of the end user. Analyze the possibility of editing the Contracts page so that the supplier's name is indicated as information about the supplier. Make the appropriate changes.

To do this, go to editing page 3 - Contracts, select the CONTRACTS report for editing (Figure 27) and make the appropriate changes to the SQL query in the Source section (Figure 28).

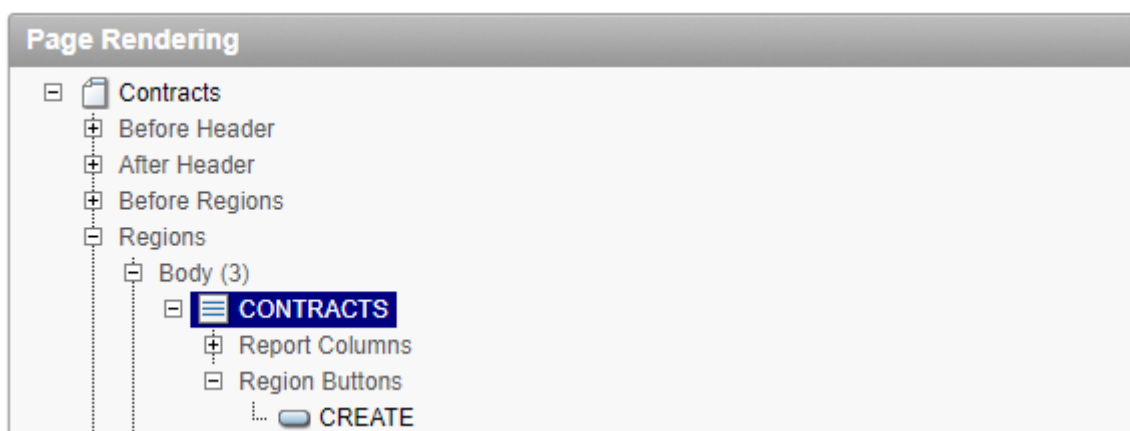


Figure 27

Source

Region Source

```

select
"CONTRACT_NUMBER",
"CONTRACT_DATE",
"SUPPLIER_CODE",
"CONTRACT_NOTE"
from "CONTRACTS"

```

Figure 28

As a result of the changes made, the following result should be obtained (Figure 29).

Suppliers

Contracts

Deliveries

Products

Contracts

Q-

Go

Actions ▾

Create


	<u>Contract Number</u>	<u>Contract Date</u>	<u>Supplier Code</u>	<u>Contract Note</u>
	123456	15-NOV-2017	ЗАО "Транссервис"	Основание - накладная №34 от 30/10/17

Figure 29

2. After the changes were made, the heading of the Supplier Code column no longer matched the submitted data. Analyze the ability to edit the Contracts page so that the Supplier Name is specified as the column name corresponding to the supplier information. Make the appropriate changes.

To do this, go to editing page 3 - Contracts, select the SUPPLIER_CODE column of the CONTRACTS report for editing (Figure 30) and make the appropriate changes in the Column Heading field.



Figure 30

Report requirements:

- 1) briefly describe the main stages of the work;
- 2) give the appearance of the application created during the execution of the work and the schema of the database used;
- 3) give the results of the assignments for independent work.