

Создание простейших приложений в ORACLE APEX

Графеева Н.Г.

2017

- Oracle Application Express предназначен для создания приложений, ориентированных на базы данных. Инструмент Application Builder, входящий в состав ORACLE APEX, предоставляет большой набор готовых компонент и шаблонов для создания приложений:
 - темы для интерфейса
 - элементы навигации
 - шаблоны форм
 - гибко настраиваемые отчёты

Основная терминология

- Workspace – позволяет нескольким разработчикам работать в рамках одного экземпляра Oracle Application Express. В идеале: одно приложение – один workspace.
- Application – "проект" в классическом понимании. Это коллекция страниц и связей между ними. Содержит механизм аутентификации и общие настройки темы для GUI.
- Page – базовый блок для построения приложений. Страницы являются контейнерами всех остальных элементов.
- Region – логическое разбиение содержимого страницы. На странице их может быть много. Они могут быть разного типа: HTML, SQL Queries, PL/SQL-generated HTML, charts.
- Item – text field, text area, password, select list, check box и так далее.

Как это работает

- Приложение описывается различными метаданными.
- Разработанное приложение сохраняется в базе данных (для этого предусмотрены специальные системные таблицы).
- При каждом обращении http-запрос транслируется в запрос к БД и на основе полученных метаданных строится очередная форма.
- Все сессии хранятся в БД.

- Oracle APEX – это большое и сложное хозяйство. Его надо настраивать, им надо управлять. Возможно, при наличии определённых навыках, оно позволит действительно быстро и удобно создавать database oriented приложения. Попробуем убедиться в этом на конкретных примерах...

Пример 1(создание
приложения – отчета по двум
таблицам)

Выберем инструмент Application Builder

The screenshot displays the Oracle Application Express (APEX) dashboard. At the top, there is a navigation bar with the Oracle logo and several menu items: Application Express, Application Builder, SQL Workshop, Team Development, and Packaged Apps. Below this, four main tool icons are visible: Application Builder (blue), SQL Workshop (green), Team Development (yellow), and Packaged Apps (red). The dashboard is divided into several sections: 'Top Applications' (empty), 'Top Users' (showing N Grafieva with 33 users), 'News and Messages' (containing a system message about a 2016 user conference), and a 'Dashboard' sidebar on the right. The sidebar includes statistics for Applications (5), Tables (28), Features (0), and Packaged Apps (1). It also lists 'Site-Specific Tasks' such as 'APEX Meetups', 'Download Oracle Application Express', and 'Who do I contact for help?'. At the bottom, there is a footer with language options (Deutsch, English, Español, Français, Italiano, Português (Brasil), 中文 (繁體), 中文 (简体), 日本語, 한국어), user information (n.grafieva@spb.ru), copyright notice (Copyright © 1999, 2015, Oracle. All rights reserved.), and the version number (Application Express 5.0.3.00.03).

Oracle Application Express

Application Builder SQL Workshop Team Development Packaged Apps

Application Builder SQL Workshop Team Development Packaged Apps

Top Applications

Top Users

News and Messages

In 2016, come join the awesome APEX community at a user conference! Find one [here](#).

System Message

Dashboard

5 Applications 28 Tables

0 Features 1 Packaged Apps

Site-Specific Tasks

APEX Meetups

Download Oracle Application Express

Who do I contact for help?

Oracle Application Express Discussion Forum

Accessibility Mode

Standard

Page events: 1 hours (Edit Reporting Timeframe)

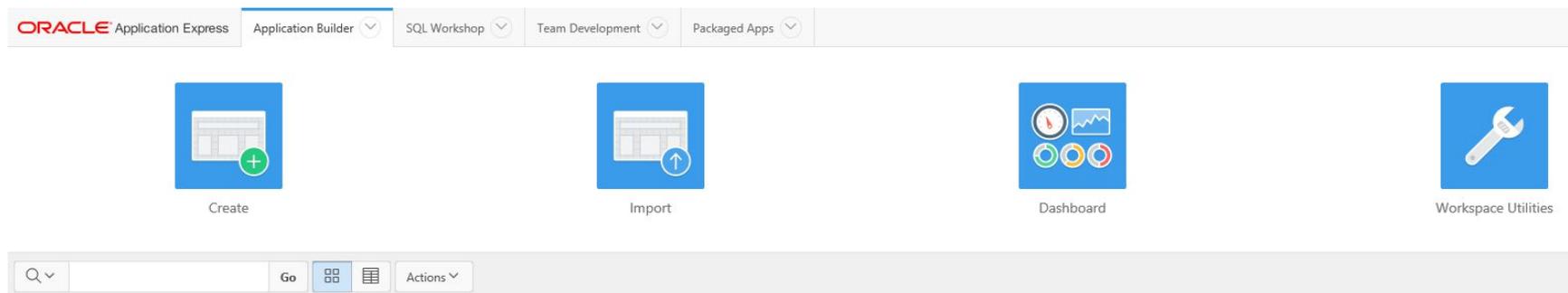
Deutsch · English · Español · Français · Italiano · Português (Brasil) · 中文 (繁體) · 中文 (简体) · 日本語 · 한국어

n.grafieva@spb.ru grafieva en

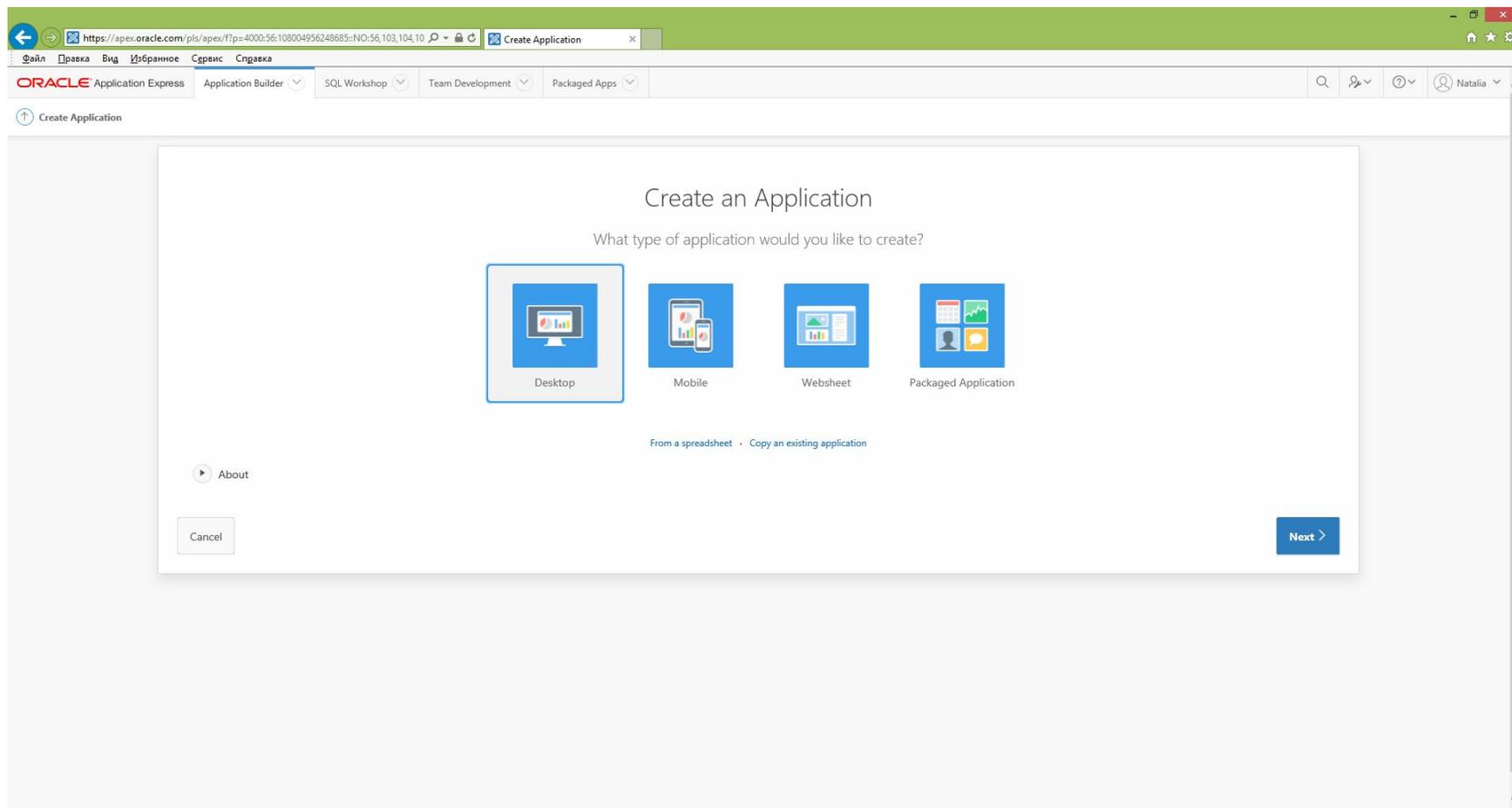
Copyright © 1999, 2015, Oracle. All rights reserved.

Application Express 5.0.3.00.03

Попытаемся создать Database Application



Уточним тип создаваемого приложения



Зададим название приложения и ОПЦИИ

Oracle Application Express Application Builder SQL Workshop Team Development Packaged Apps Natalia

Create an Application

Name

User Interface Desktop

Schema GRAFEEVA

Name N Grafееva 5

Application 95982

Theme Universal Theme (42)

Theme Style Vita

Cancel Create Application Next >

Create an Application



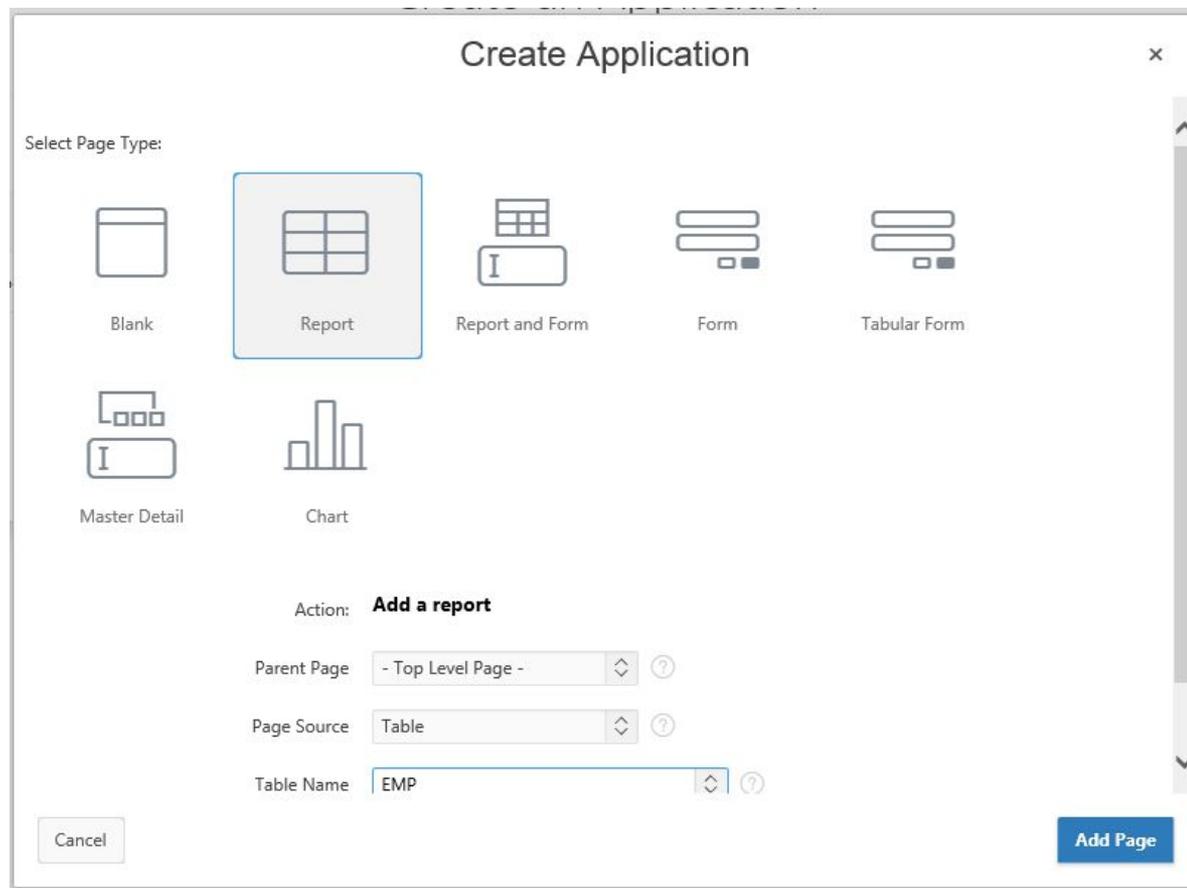
Page	Name	Type	Page Mode	Source Type	Source	Parent Page
	1	Home	Blank	Normal	-	-

Add Page

< Cancel

Create Application Next >

Выберем тип первой страницы (Report) и зададим соответствующую таблицу



The image shows a 'Create Application' dialog box with the following elements:

- Select Page Type:** A grid of icons representing different page types. The 'Report' icon, which depicts a table, is highlighted with a blue border.
- Page Type Options:** Blank, Report, Report and Form, Form, Tabular Form, Master Detail, and Chart.
- Action:** Add a report
- Parent Page:** - Top Level Page -
- Page Source:** Table
- Table Name:** EMP
- Buttons:** Cancel and Add Page

Выберем тип второй страницы (Report) и зададим соответствующую таблицу

The screenshot shows a 'Create Application' dialog box with the following elements:

- Select Page Type:** A grid of icons representing different page types. The 'Report' icon, which depicts a table, is highlighted with a blue border.
- Action:** A dropdown menu set to 'Add a report'.
- Parent Page:** A dropdown menu set to '- Top Level Page -'.
- Page Source:** A dropdown menu set to 'Table'.
- Table Name:** A text input field containing the value 'DEPT'.
- Buttons:** A 'Cancel' button on the bottom left and an 'Add Page' button on the bottom right.

Посмотрим на созданное множество страниц

Create an Application



Pages

	Page	Name	Type	Page Mode	Source Type	Source	Parent Page	
	1	Home	Blank	Normal	-	-	-	×
	2	Emp	Report	Normal	Table	EMP	-	×
	3	Dept	Report	Normal	Table	DEPT	-	×

Add Page



Cancel

Create Application

Next >

Откажемся от использования разделяемых компонент

Create an Application



Shared Components

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, copy the shared components from an existing application.

Copy Shared Components from Another Application: Yes No



Cancel

Next >

Уточним формат вывода дат в приложении

Create an Application



Authentication Scheme	Application Express Accounts	?
Language	English (en)	?
User Language Preference Derived From	Application Primary Language	?
Date Format	DD-MON-YYYY	?
Date Time Format	DD-MON-YYYY	?
Timestamp Format	DD-MON-YYYY	?
Timestamp Time Zone Format		?

< Cancel

Подтвердим намерение о создании приложения (Create Application)

Create an Application



Confirm

You have requested to create an application with the following attributes. Please confirm your selections.

Application	95982
Name	N Grafeeva 5
Parsing Schema	GRAFEEVA
Default Language	en
Navigation	Navigation Menu List
Default Authentication Scheme	Application Express Authentication
Theme Type	Standard
Theme	Universal Theme
Subscribe Theme	No



Cancel

Create Application

Запустим готовое приложение (Run Application)

The screenshot displays the Oracle APEX Application Builder interface. At the top, the browser address bar shows the URL: `https://apex.oracle.com/pls/apex/f?p=4000:1:108004956248685::NO:RP:F4000_P1_F`. The application title is "Application Builder". The navigation menu includes "Application Express", "Application Builder", "SQL Workshop", "Team Development", and "Packaged Apps". The user is logged in as "Natalia".

A green notification banner at the top left states: "Application created successfully." Below this, the application name is "Application 95982 - N Grafeeva 5".

The main workspace contains five icons representing different actions:

- Run Application (highlighted with a green play button)
- Supporting Objects
- Shared Components
- Utilities
- Export / Import

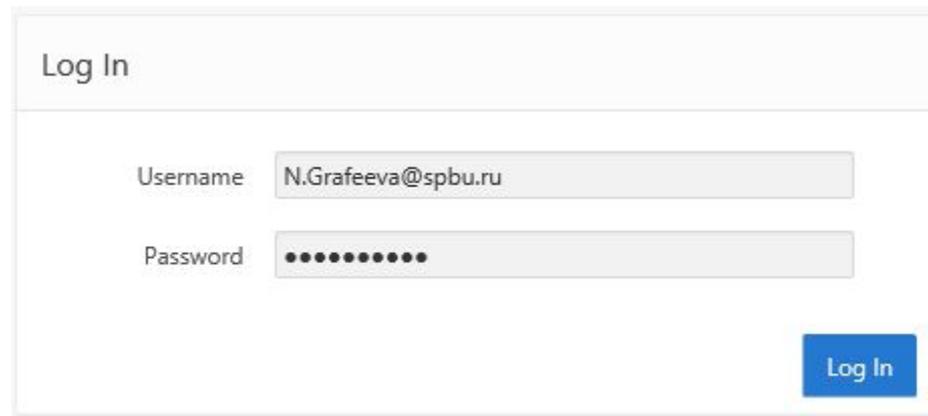
Below the workspace is a search bar and a "Go" button. A "Create Page" button is located on the right side of the workspace.

The bottom section shows a list of pages:

- 1 - Home
- 2 - Emp
- 3 - Dept
- 101 - Login Page

The footer contains the user's email address "n.grafeeva@spb.ru", the application name "grafeeva", the language "en", the copyright notice "Copyright © 1999, 2015, Oracle. All rights reserved.", and the version "Application Express 5.0.3.00.03".

Окно аутентификации (по АРЕХ)



Log In

Username

Password

Вторая страница приложения

The screenshot displays an Oracle APEX application interface. The browser address bar shows the URL: <https://apex.oracle.com/pls/apex/f?p=95982:2:115155182112122::NO::>. The application title is "N Grafeeva 5". The main content area is titled "Emp" and contains a table with the following columns: Empno, Ename, Job, Mgr, Hiredate, Sal, Comm, and Deptno. The table lists 14 employees with their respective details. A search bar and "Go" button are located above the table. The footer of the application includes navigation links: Home, Application 95982, Edit Page 2, Session, View Debug, Debug, Show Grid, Quick Edit, and Theme Roller.

	Empno	Ename	Job	Mgr	Hiredate	Sal	Comm	Deptno
	7839	KING	PRESIDENT	-	17-NOV-1981	4970	-	10
	7698	BLAKE	MANAGER	7839	01-MAY-1981	2820	-	30
	7782	CLARK	MANAGER	7839	09-JUN-1981	2420	-	10
	7566	JONES	MANAGER	7839	02-APR-1981	2945	-	20
	7788	SCOTT	ANALYST	7566	09-DEC-1982	7485	-	20
	7902	FORD	ANALYST	7566	03-DEC-1981	2985	-	20
	7369	SMITH	CLERK	7902	17-DEC-1980	770	-	20
	7499	ALLEN	SALESMAN	7698	20-FEB-1981	1570	300	30
	7521	WARD	SALESMAN	7698	22-FEB-1981	1220	500	30
	7654	MARTIN	SALESMAN	7698	28-SEP-1981	1220	1400	30
	7844	TURNER	SALESMAN	7698	08-SEP-1981	1470	0	30
	7876	ADAMS	CLERK	7788	12-JAN-1983	1070	-	20
	7900	JAMES	CLERK	7698	03-DEC-1981	920	-	30
	7934	MILLER	CLERK	7782	23-JAN-1982	1270	-	10

Третья страница приложения

The screenshot shows a web browser window displaying an Oracle APEX application. The browser's address bar shows the URL: `https://apex.oracle.com/pls/apex/f?p=95982:3:115155182112122::NO::`. The application page has a blue header with the user name 'N Grafeeva 5' and a 'Log Out' link. A left sidebar contains navigation links for 'Home', 'Emp', and 'Dept', with 'Dept' selected. The main content area is titled 'Dept' and features a search bar, a 'Go' button, and an 'Actions' dropdown menu. Below this is a table with four columns: 'Deptno', 'Dname', and 'Loc'. The table contains four rows of data, each with a pencil icon in the first column. The data is as follows:

	Deptno	Dname	Loc
	10	ACCOUNTING	NEW YORK
	20	RESEARCH	DALLAS
	30	SALES	CHICAGO
	40	OPERATIONS	BOSTON

At the bottom right of the table, there is a page indicator '1 - 4'. At the bottom of the page, there is a footer with the text 'release 1.0 Set Screen Reader Mode On'. The bottom status bar of the browser shows various application controls: Home, Application 95982, Edit Page 3, Session, View Debug, Debug, Show Grid, Quick Edit, and Theme Roller.

Пример 2 (табличный отчет и форма для редактирования и добавления новых записей – Report and Form)

Зададим название приложения и ОПЦИИ

Create an Application

Name

* User Interface **Desktop**

Schema ?

* Name ?

* Application ?

Theme ^ ?

Theme Style ?



Cancel

Create Application

Выберем тип создаваемой страницы (Report and Form)

The screenshot shows the Oracle APEX Application Builder interface. A modal dialog titled "Create an Application" is open, allowing the user to select a page type. The "Report and Form" option is selected and highlighted with a blue border. Below the selection options, the action is defined as "Add a report with an edit form on a second page". The configuration fields are as follows:

- Parent Page: - Top Level Page -
- Table Name: EMP
- Report Type: Classic

The background shows a partially visible "Page" configuration window with a "Page" table and a "Parent Page" configuration window with an "Add Page" button. The main interface includes navigation tabs for "Application Express", "Application Builder", "SQL Workshop", "Team Development", and "Packaged Apps".

Посмотрим на созданный набор страниц

Create an Application



Pages

	Page	Name	Type	Page Mode	Source Type	Source	Parent Page	
	1	Home	Blank	Normal	-	-	-	X
	2	Emp	Report	Normal	Table	EMP	-	X
	3	Emp	Form	Normal	Table	EMP	2	X

Add Page

< Cancel

Create Application **Next >**

Откажемся от использования разделяемых компонент

Create an Application



Shared Components

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, copy the shared components from an existing application.

Copy Shared Components from Another Application: Yes No



Cancel

Next >

Уточним атрибуты и формат дат

Create an Application

Progress indicator: 4 steps, with the 4th step labeled "Attributes" highlighted in blue.

Authentication Scheme: Application Express Accounts

Language: English (en)

User Language Preference Derived From: Application Primary Language

Date Format: DD-MON-YYYY

Date Time Format: DD-MON-YYYY

Timestamp Format: DD-MON-YYYY

Timestamp Time Zone Format:

Navigation: < Cancel (left) | Next > (right)

Подтвердим свои намерения (Create Application)

Create an Application

You have requested to create an application with the following attributes. Please confirm your selections.

Application	95984
Name	N Grafeeva 6
Parsing Schema	GRAFEEVA
Default Language	en
Navigation	Navigation Menu List
Default Authentication Scheme	Application Express Authentication
Theme Type	Standard
Theme	Universal Theme
Subscribe Theme	No

< Cancel Create Application

Запустим созданное приложение (Run Application)

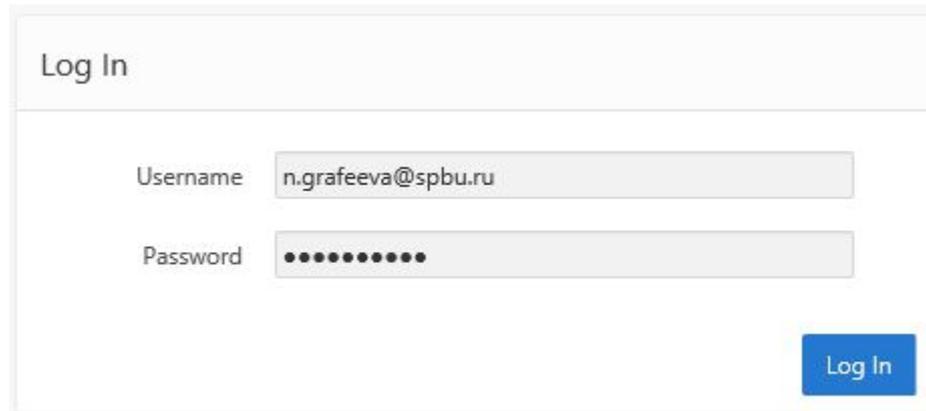
The screenshot displays the Oracle APEX Application Builder interface. At the top, the browser address bar shows the URL: https://apex.oracle.com/pls/apex/f?p=4000:1:108004956248685::NO:RP:F4000_P1. The application title is "Application Builder" and the user is logged in as "Natalia".

The main content area shows a notification: "Application created successfully." Below this, the application name is "Application 95984 - N Grafeeva 6". A row of five icons is displayed: "Run Application" (a blue square with a white play button), "Supporting Objects" (a blue square with a white document icon), "Shared Components" (a blue square with four colored icons), "Utilities" (a blue square with a white wrench icon), and "Export / Import" (a blue square with a white document icon and a green arrow). Below this row, a search bar and a "Go" button are visible. A row of four page icons is shown: "1 - Home", "2 - Emp", "3 - Emp", and "101 - Login Page". A "Create Page" button is located on the right side of this row.

The right sidebar contains a "Tasks" section with "Delete this Application" and "Copy this Application" options. Below that, the "Recently Edited Pages" section lists: "3. Emp", "101. Login Page", "1. Home", and "2. Emp".

The footer of the interface includes the user email "n.grafeeva@spsbu.ru", the name "grafeeva", the language "en", the copyright notice "Copyright © 1999, 2015, Oracle. All rights reserved.", and the version "Application Express 5.0.3.00.03".

Окно аутентификации (как в АРЕХ)



Log In

Username

Password

Страница – табличный отчет

The screenshot displays an Oracle APEX application interface. The browser address bar shows the URL: <https://apex.oracle.com/pls/apex/f?p=95984:2:112791682140819::NO::>. The application title is "N Grafeeva 6". The main content area is titled "Emp" and displays a table report for the "EMP" table. The table has columns: Ename, Job, Mgr, Hiredate, Sal, Comm, and Deptno. The data is as follows:

	Ename	Job	Mgr	Hiredate	Sal	Comm	Deptno
	ADAMS	CLERK	7788	12-JAN-1983	1070		20
	ALLEN	SALESMAN	7698	20-FEB-1981	1570	300	30
	BLAKE	MANAGER	7839	01-MAY-1981	2820		30
	CLARK	MANAGER	7839	09-JUN-1981	2420		10
	FORD	ANALYST	7566	03-DEC-1981	2985		20
	JAMES	CLERK	7698	03-DEC-1981	920		30
	JONES	MANAGER	7839	02-APR-1981	2945		20
	KING	PRESIDENT		17-NOV-1981	4970		10
	MARTIN	SALESMAN	7698	28-SEP-1981	1220	1400	30
	MILLER	CLERK	7782	23-JAN-1982	1270		10
	SCOTT	ANALYST	7566	09-DEC-1982	7485		20
	SMITH	CLERK	7902	17-DEC-1980	770		20
	TURNER	SALESMAN	7698	08-SEP-1981	1470	0	30
	WARD	SALESMAN	7698	22-FEB-1981	1220	500	30

Below the table, there is a "Spread Sheet" button and a page indicator "1 - 14". The application footer includes a "Reset" button and a utility bar with icons for Home, Application 95984, Edit Page 2, Session, View Debug, Debug, Show Grid, Quick Edit, Theme Roller, and a "Create" button.

Страница - редактирование

The screenshot displays an Oracle APEX application interface for editing an employee record. The browser address bar shows the URL: https://apex.oracle.com/pls/apex/f?p=95984:3:112791682140819:::P3_EMPNO:76. The application title is "Application Builder" and the current page is "Emp".

The user is logged in as "N Grafeeva 6". The navigation menu on the left includes "Home" and "Emp". The main content area is titled "Emp / Emp" and "Edit EMP".

The form contains the following fields:

Field Name	Value
Ename	ADAMS
Job	CLERK
Mgr	7788
Hiredate	12-JAN-1983
Sal	1070
Comm	
Deptno	20

Buttons: Cancel, Delete, Save.

Footer: release 1.0 [Set Screen Reader Mode On](#)

Bottom toolbar: Home, Application 95984, Edit Page 3, Session, View Debug, Debug, Show Grid, Quick Edit, Theme Roller.

Страница - добавление

The screenshot displays a web browser window with the URL `https://apex.oracle.com/pls/apex/f?p=95984:3:112791682140819::NO:3::&cs=32a`. The browser tabs include 'Application Builder', 'Dept', and 'Emp'. The application header shows the user 'N Grafeeva 6' and a 'Log Out' link. A left sidebar contains 'Home' and 'Emp' menu items. The main content area is titled 'Emp / Emp' and contains a form labeled 'Edit EMP'. The form includes the following fields: 'Ename', 'Job', 'Mgr', 'Hiredate' (with a calendar icon), 'Sal', 'Comm', and 'Deptno'. Each field has a help icon. At the bottom left of the form is a 'Cancel' button, and at the bottom right is a 'Create' button. The footer of the application contains the text 'release 1.0 [Set Screen Reader Mode On](#)' and a utility bar with icons for Home, Application 95984, Edit Page 3, Session, View Debug, Debug, Show Grid, Quick Edit, and Theme Roller.

Примечание

- Страницы типа Form могут использоваться и вне контекста Report and Form. Они могут использоваться для добавления новых записей к любой таблице БД.

Пример 3 (создание страниц типа Master Detail)

Для каких таблиц возможно создание таких страниц?

- Страницы типа Master Detail могут создаваться для таблиц, связанных правилами целостности Foreign Key (например, DEPT и EMP в демонстрационной базе). При этом родительская таблица (т.е. DEPT) выступает в роли Master, а подчиненная таблица в роли Detail (т.е. EMP).
- Соответствующее правило целостности в базе:
- ALTER TABLE EMP
- ADD FOREIGN KEY (DEPTNO)
- REFERENCES DEPT(DEPTNO) ENABLE

Зададим имя и опции для нового приложения

Create an Application



* User Interface **Desktop**

Schema GRAFEEVA ?

* Name N Grafeeva 7 ?

* Application 89217 ?

Theme Universal Theme (42) ^ ?

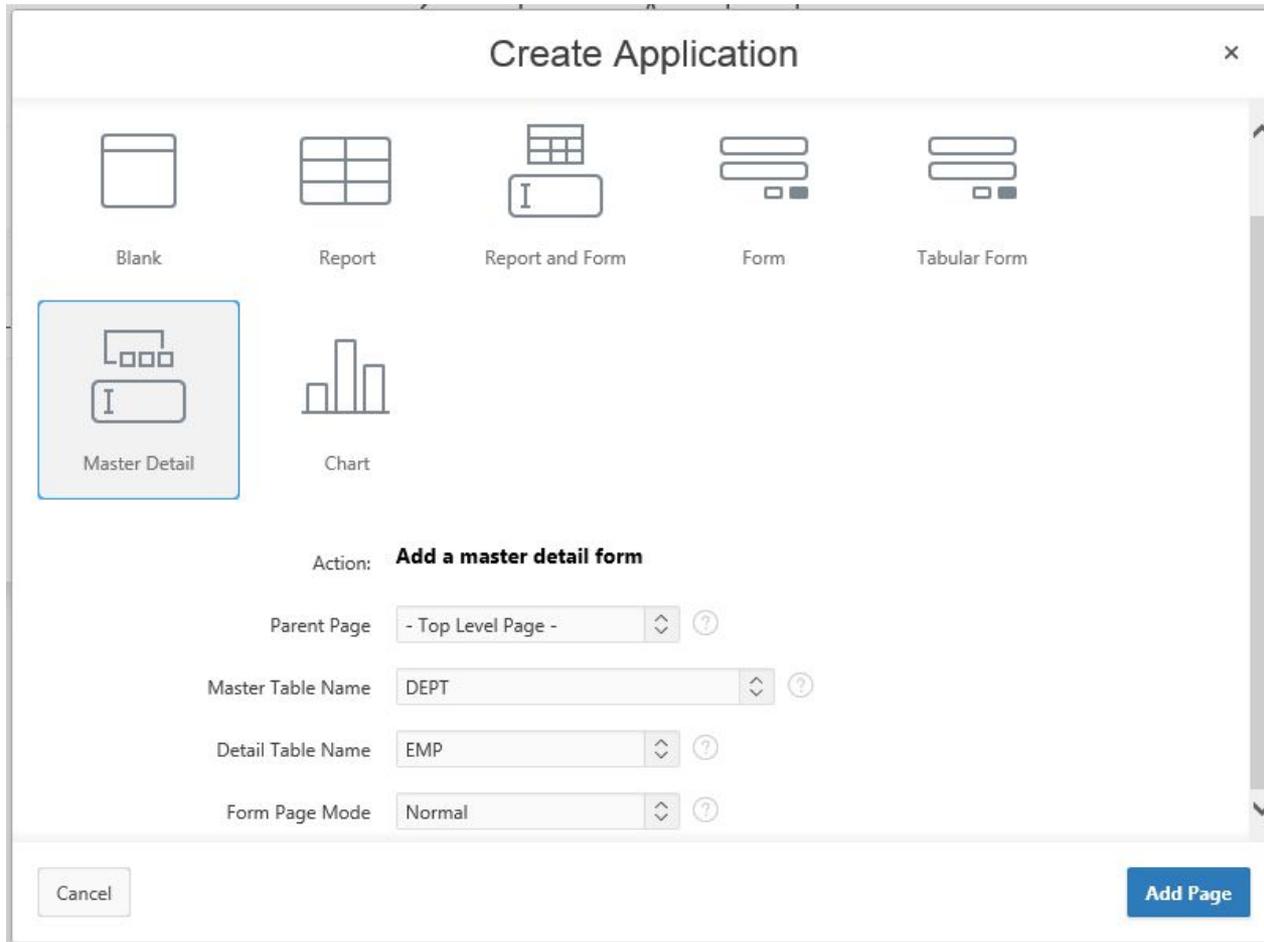
Theme Style Vita ?



Cancel

Create Application

Выберет тип страницы – Master Detail



The screenshot shows a 'Create Application' dialog box with a grid of page type icons. The 'Master Detail' icon, which depicts a master table and a detail table, is highlighted with a blue border. Below the grid, the 'Action' is set to 'Add a master detail form'. The 'Parent Page' is set to '- Top Level Page -', the 'Master Table Name' is 'DEPT', the 'Detail Table Name' is 'EMP', and the 'Form Page Mode' is 'Normal'. The 'Add Page' button is highlighted in blue.

Create Application

Blank Report Report and Form Form Tabular Form

Master Detail Chart

Action: **Add a master detail form**

Parent Page: - Top Level Page -

Master Table Name: DEPT

Detail Table Name: EMP

Form Page Mode: Normal

Cancel Add Page

Посмотрим на множество сформированных страниц

The screenshot shows the Oracle Application Express 'Create Application' wizard in the 'Pages' step. The progress bar indicates that the 'Pages' step is currently active. The main content area displays a table of existing pages and an 'Add Page' section with various page type options.

Page	Page Name	Page Type	Source Type	Source	Delete
1	Dept	Report	Table	DEPT	×
2	Master Detail	Master Detail	Table	EMP	×

Add Page Add Page

Select Page Type:

- Blank
- Report
- Report and Form
- Form
- Tabular Form
- Master Detail
- Chart

Откажемся от использования Shared Components

Create an Application



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, copy the shared components from an existing application.

Copy Shared Components from Another Application: Yes ⓘ
 No

< Cancel

Уточним атрибуты и формат дат

Create an Application

Progress indicator: 3 green checkmarks, 1 blue circle labeled "Attributes".

Authentication Scheme: Application Express Accounts ?

Language: English (en) ?

User Language Preference Derived From: Application Primary Language ?

Date Format: DD-MON-YYYY ^ ?

Date Time Format: DD-MON-YYYY ^ ?

Timestamp Format: DD-MON-YYYY x ^ ?

Timestamp Time Zone Format: ^ ?

< Cancel

Запустим приложение (Run Application)

The screenshot displays the Oracle APEX Application Builder web interface. At the top, the browser address bar shows the URL https://apex.oracle.com/pls/apex/f?p=4000:1:108004956248665::NO:RP:F4000_P1. The page title is "Application Builder" and the user is logged in as "N Grafееva 6 - Log In".

The main navigation bar includes "ORACLE Application Express", "Application Builder", "SQL Workshop", "Team Development", and "Packaged Apps". A search bar and user profile "Natalia" are also visible.

A green notification banner at the top left states "Application created successfully." Below this, the application name "Application 89217 - N Grafееva 7" is displayed with an "Edit Application Properties" button.

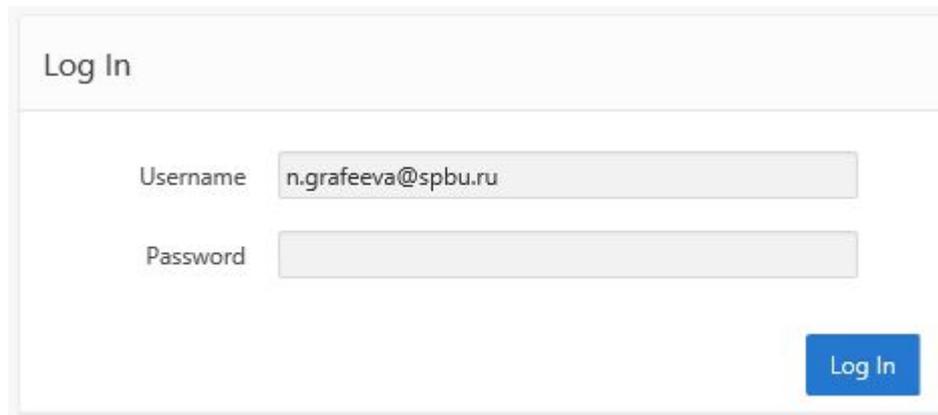
The central workspace features five main action buttons: "Run Application" (with a play icon), "Supporting Objects" (with a document icon), "Shared Components" (with a gear and lock icon), "Utilities" (with a wrench icon), and "Export / Import" (with a document and arrows icon).

Below the workspace is a search bar with a "Go" button and an "Actions" dropdown menu. A "Create Page" button is located on the right side of this bar.

The bottom section shows a list of pages: "1 - Home" and "101 - Login Page".

The footer contains the email "n.grafeeva@spsb.ru", the name "grafeeva", the locale "en", the copyright notice "Copyright © 1999, 2015, Oracle. All rights reserved.", and the version "Application Express 5.0.3.00.03".

Окно аутентификации (как в АРЕХ)



Log In

Username

Password

Страница с Master-таблицей

The screenshot shows a web browser window displaying an Oracle APEX application. The browser title is 'Dept - Windows Internet Explorer'. The address bar shows the URL: `http://apex.oracle.com/pls/apex/f?p=41828:1:103277627508271`. The page title is 'Приложение 3'. The user is logged in as 'grafeyeva@is4b.ru' and has a 'Logout' button. The main content area is titled 'Dept' and contains a search and display control section with a search input, a 'Display' dropdown set to '15', and a 'Go' button. Below this is a table with columns 'Dname' and 'Loc'. The table contains four rows of data, each with a pencil icon for editing. At the bottom of the table, it shows '1 - 4' and a 'Spread Sheet' link. The footer of the application includes navigation links: Home, Application 41828, Edit Page 1, Create, Session, Caching, View Debug, Debug, Show Grid, and Show Edit Links. The browser status bar shows 'Интернет' and a zoom level of 100%.

Приложение 3 grafeyeva@is4b.ru Logout

Dept

Dept Reset Create

Search Display 15 Go

	Dname ▲	Loc
	ACCOUNTING	NEW YORK
	OPERATIONS	BOSTON
	RESEARCH	DALLAS
	SALES	CHICAGO

1 - 4 [Spread Sheet](#)

Home Application 41828 Edit Page 1 Create Session Caching View Debug Debug Show Grid Show Edit Links

Интернет 100%

Страница с Detail-таблицей

The screenshot shows a web browser window displaying an Oracle APEX application. The page title is 'Приложение 3'. The browser address bar shows the URL: `http://apex.oracle.com/pls/apex/f?p=41828:2:103277627508271:::P2_DEPTNO:10`. The page content is organized into several sections:

- Header:** 'Приложение 3' with a user profile 'grafeyeva@is4b.ru' and a 'Logout' button.
- Navigation:** 'Dept' and 'Dept > Master Detail'.
- Edit DEPT Form:** Contains two input fields: 'Dname' with the value 'ACCOUNTING' and 'Loc' with the value 'NEW YORK'. Below the fields is the text '1 of 4'. Action buttons include 'Cancel', 'Delete', 'Save', and a right arrow '>'.
- EMP Detail Table:** A table with columns: 'Ename', 'Comm', 'Mar', 'Hiredate', 'Sal', and 'Job'. It contains three rows of employee data. Action buttons 'Delete Checked' and 'Add Row' are located above the table.

<input type="checkbox"/>	Ename	Comm	Mar	Hiredate	Sal	Job
<input type="checkbox"/>	KING			17-NOV-1981	5000	PRESIDENT
<input type="checkbox"/>	CLARK		7839	09-JUN-1981	2450	MANAGER
<input type="checkbox"/>	MILLER		7782	23-JAN-1982	1300	CLERK

At the bottom of the page, there is a navigation bar with links: 'Home', 'Application 41828', 'Edit Page 2', 'Create', 'Session', 'Caching', 'View Debug', 'Debug', 'Show Grid', and 'Show Edit Links'. The status bar at the very bottom shows 'Готово' and 'Интернет'.

Примечание

- Форма, в которой представлена Detail-таблица называется табулированной формой (Tabular Form). Представление в виде Tabular Form возможно и вне контекста Master Detail для любой таблицы.

Пример 4 (построение Master Detail по Self-Referenced правилам целостности)

-

- В демонстрационной базе ORACLE есть одно такое правило:
- ALTER TABLE "EMP" ADD FOREIGN KEY ("MGR")
- REFERENCES "EMP" ("EMPNO") ENABLE



Create an Application



Name

* User Interface **Desktop**

Schema GRAFEEVA  

* Name N Grafeeva 8 

* Application 95998 

Theme Universal Theme (42)  

Theme Style Vita  



Cancel

Create Application

Next >

В качестве Master и Detail укажем одну и ту же таблицу EMP

Create Application

Blank Report Report and Form Form Tabular Form

Master Detail Chart

Action: **Add a master detail form**

Parent Page: - Top Level Page -

Master Table Name: EMP

Detail Table Name: EMP

Form Page Mode: Normal

Cancel Add Page



Browser window showing the Oracle Application Express interface. The address bar displays the URL: <https://apex.oracle.com/pls/apex/f?p=4000:433:108004956248685::NO::>. The browser tabs include "Create Application", "Dept", "N Grafeeva 6 - Log In", and "N Grafeeva 7 - Log In". The Oracle Application Express navigation bar shows "Application Builder" selected, along with "SQL Workshop", "Team Development", and "Packaged Apps". The user is logged in as "Natalia".

Create an Application

Progress indicator showing four steps: the first two are completed (green checkmarks), and the current step, "Shared Components", is active (blue circle).

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, copy the shared components from an existing application.

Copy Shared Components from Another Application: Yes No

Navigation buttons: < Cancel, Next >



Browser address bar: <https://apex.oracle.com/pls/apex/f?p=4000:3020:108004956248685::NO::>

Browser tabs: Create Application, Dept, N Grafeeva 6 - Log In, N Grafeeva 7 - Log In

Application Express Navigation: ORACLE Application Express, Application Builder, SQL Workshop, Team Development, Packaged Apps

User: Natalia

Create an Application

Progress indicator: 4 steps, 3 completed (green checkmarks), 1 active (blue circle labeled "Attributes")

Authentication Scheme: Application Express Accounts

Tabs: One Level of Tabs

Language: English (en)

User Language Preference Derived From: Application Primary Language

Date Format: [empty]

Date Time Format: [empty]

Timestamp Format: DD-MON-YYYY

Timestamp Time Zone Format: [empty]

Buttons: < Cancel, Next >



Browser tabs: Create Application, Dept, N Grafeeva 6 - Log In, N Grafeeva 7 - Log In

Navigation: ORACLE Application Express, Application Builder, SQL Workshop, Team Development, Packaged Apps

User: Natalia

Create an Application

Progress indicator: 4 green checkmarks, 1 blue circle labeled "Confirm"

You have requested to create an application with the following attributes. Please confirm your selections.

Application	96003
Name	N Grafeeva 8
Parsing Schema	GRAFEeva
Default Language	en
Navigation	One Level of Tabs
Default Authentication Scheme	Application Express Authentication
Theme Type	Standard
Theme	Simple Red
Subscribe Theme	No

Buttons: < Cancel, Create Application



Browser address bar: <https://apex.oracle.com/pls/apex/f?p=4000:1:108004956248685::NO:1,4150,RP:FE>

Application Builder | Dept | N Grafeeva 6 - Log In | N Grafeeva 7 - Log In | N Grafeeva 8 - Log In

ORACLE Application Express | Application Builder | SQL Workshop | Team Development | Packaged Apps

Application 96003 | 101 | Natalia

Application 96003 - N Grafeeva 8 | Edit Application Properties

Tasks

- Delete this Application >
- Copy this Application >
- Recently Edited Pages
- 101. Login Page
- 1. Home

Run Application | Supporting Objects | Shared Components | Utilities | Export / Import

Search: [] Go [] Actions [] Create Page >

1 - Home | 101 - Login Page

1 - 2

n.grafeeva@spbu.ru | grafeeva | en | Copyright © 1999, 2015, Oracle. All rights reserved. | Application Express 5.0.3.00.03

Аутентификация

Log In

Username

Password

Страница с Master-таблицей

The screenshot shows a web browser window displaying an Oracle APEX application. The browser's address bar shows the URL: `http://apex.oracle.com/pls/apex/f?p=15195:2:102257355653161::NO:::`. The application header includes the text "ГРАФЕYEVA@IS4B.KU.UZ" and a user profile for "grateyeva@is4b.ru" with a "Logout" link. The main content area is titled "Emp" and contains a "Reset" and "Create" button. Below this is a search and display control section with a search input field, a "Display" dropdown set to "15", and a "Go" button. The central part of the page is a table with the following data:

Ename	Job	Mgr	Hiredate	Sal	Comm	Deptno
ADAMS	CLERK	7788	12-JAN-1983	1200		20
ALLEN	SALESMAN	7698	20-FEB-1981	1600	300	30
BLAKE	MANAGER	7839	09-MAY-1981	2850		30
CLARK	MANAGER	7839	09-JUN-1981	2450		10
FORD	ANALYST	7566	03-DEC-1981	3000		20
JAMES	CLERK	7698	03-DEC-1981	950		30
JONES	MANAGER	7839	02-APR-1981	2975		20
KING	PRESIDENT		17-NOV-1981	5000		10
MARTIN	SALESMAN	7698	28-SEP-1981	1250	1400	30
MILLER	CLERK	7782	23-JAN-1982	1300		10
SCOTT	ANALYST	7566	03-DEC-1981	3000		20

At the bottom of the application, there is a status bar with the text "Application 15195 Edit Page 2" and various utility links like "Caching", "View Debug", "Debug", "Show Grid", and "Show Edit Links". The browser's status bar at the very bottom shows "Интернет" and "100%".

Страница с Detail-таблицей

Master Detail - Windows Internet Explorer

http://apex.oracle.com/pls/apex/f?p=15195:3:102257355653161:::P3_EMPNO:7839

Файл Правка Вид Избранное Сервис Справка

Избранное Яндекс Почта Карты Маркет Новости Словари Видео Музыка Диск Neural Networks Oriented D...

Master Detail Страница Безопасность Сервис

Edit EMP Cancel Delete Save < >

Ename KING

Job PRESIDENT

Mgr

Hiredate 17-NOV-1981

Sal 5000

Comm

Deptno 10

9 of 14

EMP Detail Delete Checked Add Row

<input type="checkbox"/>	Ename	Deptno	Hiredate	Sal	Comm	Job
<input type="checkbox"/>	BLAKE	30	09-MAY-1981	2850		MANAGER
<input type="checkbox"/>	CLARK	10	09-JUN-1981	2450		MANAGER
<input type="checkbox"/>	JONES	20	02-APR-1981	2975		MANAGER

Home Application 15195 Edit Page 3 Create Session Caching View Debug Debug Show Grid Show Edit Links 1 - 3

Интернет 100%

Пример 5 (построение графиков - Chart)

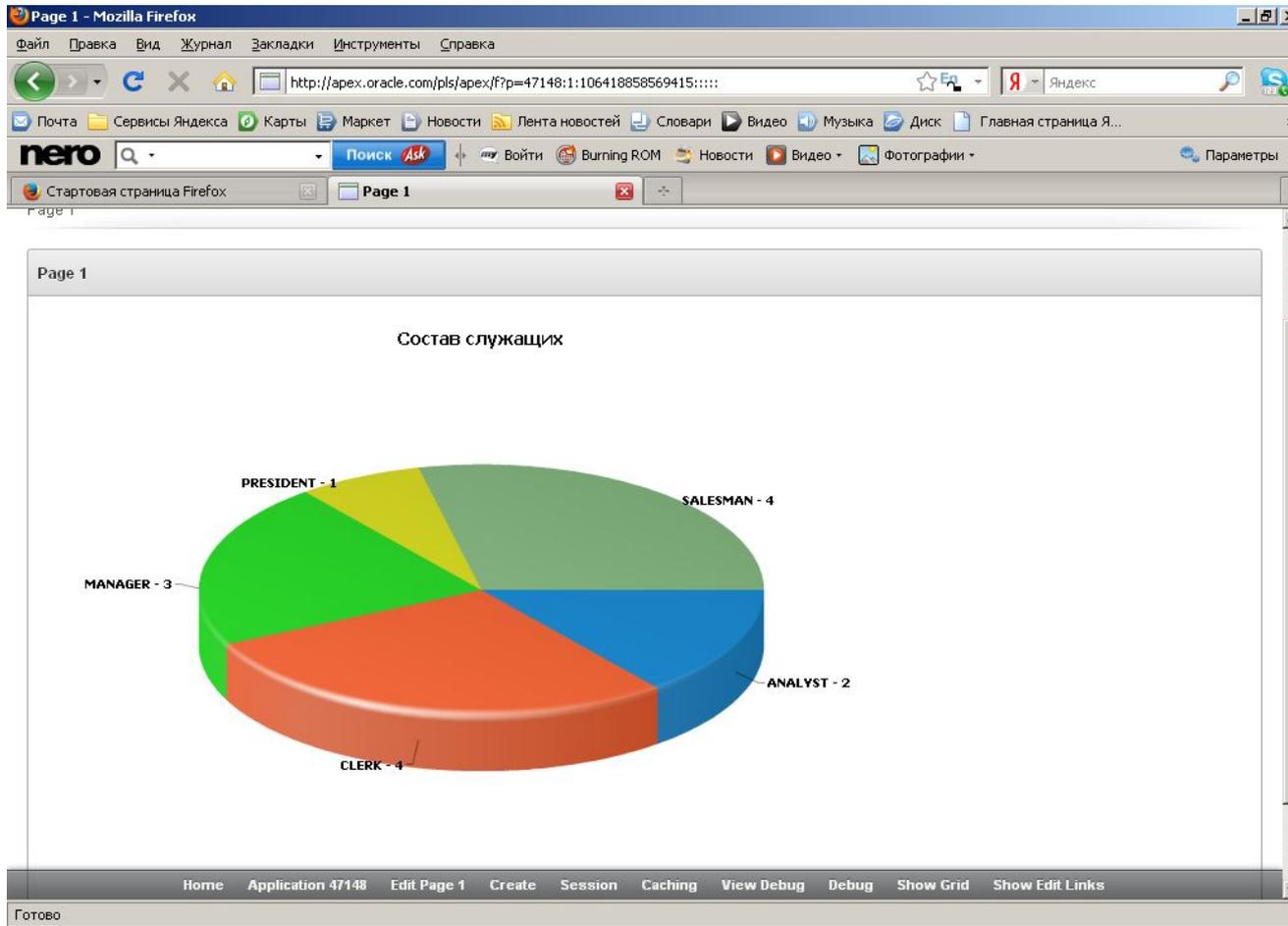
Создание страницы с графиком

The screenshot shows the Oracle APEX 'Create Application - Pages' wizard in a Mozilla Firefox browser window. The browser address bar shows the URL: `http://apex.oracle.com/pls/apex/f?p=4000:3001:17167008210136::NO:::`. The wizard interface includes a menu bar (Файл, Правка, Вид, Журнал, Закладки, Инструменты, Справка), a search bar (Поиск Ask), and a list of browser services (Почта, Сервисы Яндекса, Карты, Маркет, Новости, Лента новостей, Словари, Видео, Музыка, Диск, Главная страница Я...). The main content area displays several page templates: Blank, Report, Report and Form, Form, Tabular Form, Master Detail, and Chart. The 'Chart' option is selected with a radio button. Below the templates, the 'Action' is set to 'Add a Chart'. The 'Page Name' field contains 'Page 1'. The 'Chart Rendering' dropdown is set to 'Flash Chart'. The 'Chart Type' dropdown is set to '3D Pie'. The 'Chart Title' field contains 'Состав служащих'. At the bottom, a 'Query' text area contains the following SQL code:

```
SELECT NULL L100,  
       JOB LABEL,  
       COUNT(*) VALUE  
FROM EMP  
GROUP BY JOB  
ORDER BY JOB
```

The bottom status bar of the wizard displays the word 'Готово' (Ready).

Страница в приложении будет выглядеть так:



Редактирование приложений

- После создания первой версии приложения можно и нужно продолжать расширять его функциональность и настройку. Тем более, что список доступных типов страниц значительно расширяется при редактировании приложения.

Пример 6 (создание страницы типа Tree)

- Страницы типа Tree (иерархические структуры) можно строить по таблицам и представлениям, в которых присутствует (явно или неявно) правила целостности типа Self Referenced (в демо-базе таблица EMP).
- Отредактируем Приложение 2 и добавим к нему страницу, отображающую список сотрудников в виде иерархической структуры.

Создание страницы типа Tree

The screenshot displays the Oracle Application Express interface. A central dialog box titled "Create a Page" is open, showing the following configuration:

- Application: 91534 - N Grafeeva 2
- User Interface: Desktop
- Select a page type: Tree (highlighted)

The dialog box also lists other available page types: Blank Page, Report, Form, Plug-ins, Chart, Map Chart, Calendar, Wizard, and Data Loading. The "Tree" option is selected, and the "Next" button is visible at the bottom right of the dialog.

At the bottom of the browser window, a security warning is displayed: "Вы хотите сохранить пароль на oracle.com? Подробнее" with buttons for "Да" and "Не для этого сайта".

Уточним атрибуты страницы

The screenshot displays the Oracle APEX Application Builder interface. A modal dialog box titled "Create Tree" is open, showing the "Page Attributes" step of a wizard. The dialog contains the following fields and options:

- Page Number:** 4
- Page Name:** Tree Page
- Page Mode:** Normal
- Region Template:** Standard
- Region Name:** Tree
- Breadcrumb:** - do not use breadcrumbs on page -

At the bottom of the dialog, there are "Cancel" and "Next >" buttons. The background interface shows the application "Application 91534 - N Grafeeva 2" with a "Run Application" button and a list of pages including "1 - Home" and "2 - Page 2".

At the bottom of the browser window, a small dialog asks: "Вы хотите сохранить пароль на oracle.com? Подробнее" with "Да" and "Не для этого сайта" buttons.

Уточним пункт меню

The screenshot displays the Oracle Application Express interface. A modal dialog titled "Navigation Menu" is open, showing the configuration for a page named "Tree Page". The dialog includes a progress indicator at the top with a blue dot on the second step. The "Navigation Preference" section has three radio buttons: "Do not associate this page with a navigation menu entry" (unselected), "Create a new navigation menu entry" (selected), and "Identify an existing navigation menu entry for this page" (unselected). The "New Navigation Menu Entry" field contains the text "Tree Page". The "Parent Navigation Menu Entry" dropdown menu is open, showing the following options: "No parent selected -" (highlighted in blue), "Home", and "Page 2". The dialog has "Cancel" and "Next" buttons at the bottom.

Navigation Menu

Navigation Preference

- Do not associate this page with a navigation menu entry
- Create a new navigation menu entry
- Identify an existing navigation menu entry for this page

* New Navigation Menu Entry: Tree Page

Parent Navigation Menu Entry

- No parent selected -
- Home
- Page 2

Cancel Next

Зададим исходную таблицу

The screenshot displays the Oracle Application Express (APEX) interface. A modal dialog titled "Create Tree" is open, showing a progress bar with three steps. The second step, "Table / View Owner and Name", is currently active. Below the title, the text reads: "Select the owner of the table or view from which you want to draw the tree query." There are two input fields: "Table / View Owner" with the value "Grafeeva" and "Table / View Name" with the value "EMP (table)". The background interface shows the application "Application 91534 - N Grafeeva 2" and a "Run Application" button. At the bottom of the screen, there is a small notification box asking "Вы хотите сохранить пароль на oracle.com?" with "Да" and "Не для этого сайта" buttons.

Уточним структуру дерева

The screenshot shows the Oracle Application Express interface with a 'Create Tree' dialog box open. The dialog box has a progress bar at the top with four steps, the fourth of which is highlighted and labeled 'Query'. Below the progress bar is a text block explaining that a tree is based on a query and returns data for a hierarchy, mentioning the 'start with .. connect by' clause. Below the text is a form with five fields, each with a red asterisk and a help icon:

- ID: EMPNO (Number)
- Parent ID: MGR (Number)
- Node Text: ENAME (Varchar2)
- Start With: MGR (Number)
- Start Tree: Value is NULL

Below the form is a section titled 'Example Start With Query' with a right-pointing arrow. At the bottom of the dialog are 'Cancel' and 'Next >' buttons.

At the bottom of the entire screenshot, there is a system message: 'Вы хотите сохранить пароль на oracle.com? Подробнее' with 'Да' and 'Не для этого сайта' buttons.

Можем задать фильтры

The screenshot displays the Oracle Application Express interface. A modal dialog titled "Create Tree" is open, showing a progress bar with five steps. The fourth step, "Where and Order by", is active. The dialog prompts the user to "Identify an optional where clause and order siblings by column for your query." It includes a text input field for the "Where Clause" (with an example: "ename = 'JONES'") and a dropdown menu for "Order Siblings By" (with an example: "ENAME (Varchar2)"). Below these fields is a section for the "Current Query". Navigation buttons for "Cancel" and "Next" are visible at the bottom of the dialog. At the bottom of the browser window, a security warning asks: "Вы хотите сохранить пароль на oracle.com? Подробнее" with "Да" and "Не для этого сайта" buttons.

Создадим открывающую и закрывающую кнопки

Application Builder

Application 91534

Application 91534 - N Grafeeva 2

Run Application

1 - Home

2 - Page 2

Application Properties

Tasks

Delete this Application

Copy this Application

Recently Edited Pages

2. Page 2

101. Login Page

1. Home

Create Page >

1 - 3

Application Express 5.0.3.00.03

Вы хотите сохранить пароль на oracle.com? [Подробнее](#) Да Нет для этого сайта

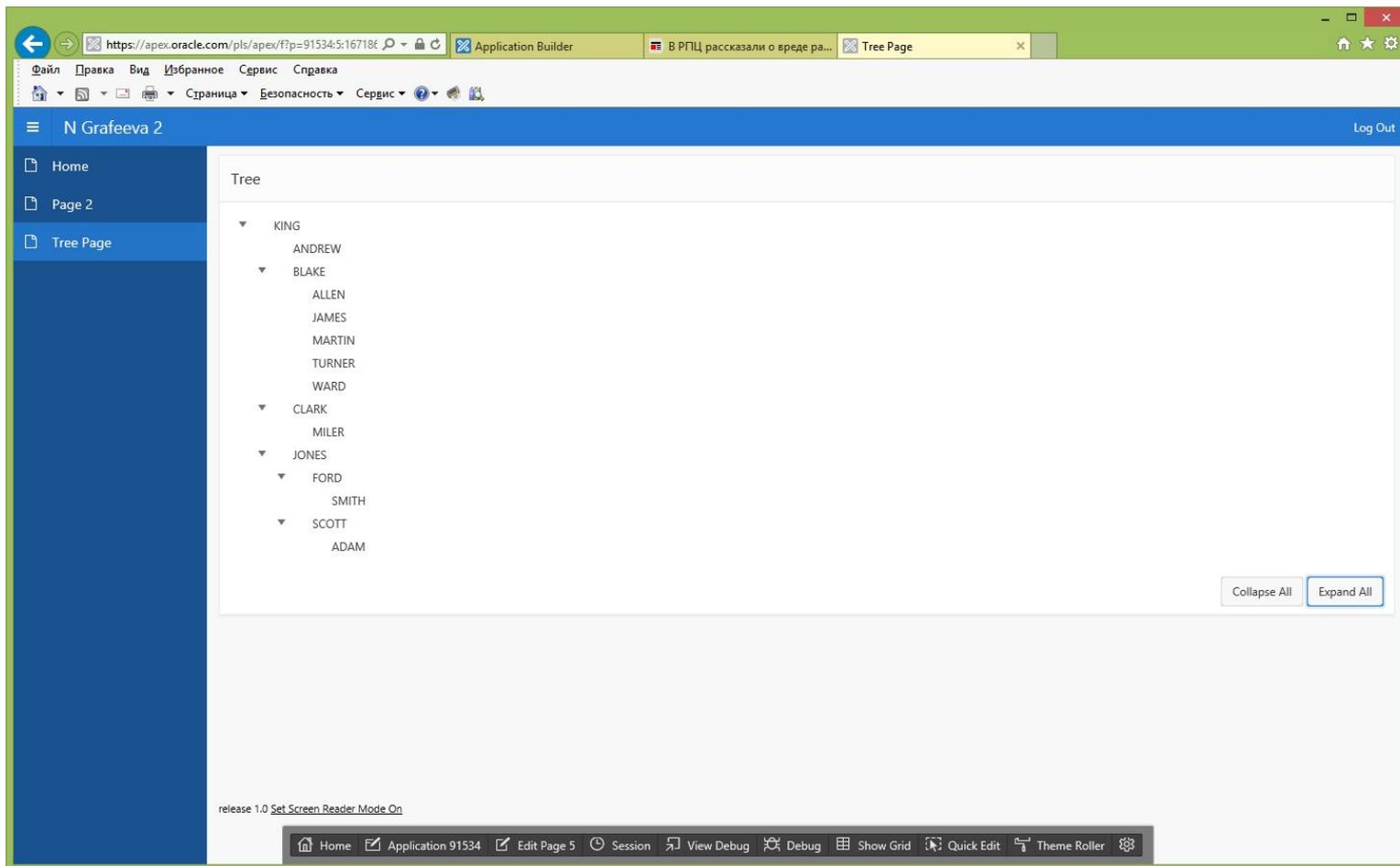
Подтвердим намерения

The screenshot displays the Oracle Application Express (APEX) interface. A modal dialog box titled "Create Tree" is centered on the screen, indicating a confirmation step in a multi-step process. The dialog contains a progress bar with seven steps, the last of which is highlighted in blue and labeled "Confirm". Below the progress bar, a message reads: "You have requested to create a tree page with the following attributes. Please confirm your selections." A table lists the selected attributes:

Application	91534
Page	4
Page Name	Tree Page
Region Title	Tree
Region Template	Standard

At the bottom of the dialog, there are "Cancel" and "Create" buttons. The background interface shows the "Application Builder" tab for "Application 91534 - N Grafeeva 2". A sidebar on the right lists tasks such as "Delete this Application" and "Copy this Application", and a "Recently Edited Pages" section. At the bottom of the browser window, a security warning asks: "Вы хотите сохранить пароль на oracle.com? Подробнее" with "Да" and "Не для этого сайта" buttons.

А вот и результат



А вот и результат...

The screenshot displays a web browser window with the URL `https://apex.oracle.com/pls/apex/f?p=91534:5:167186`. The application is titled "N Grafeeva 2" and includes a "Log Out" link. A left-hand navigation menu contains "Home", "Page 2", and "Tree Page". The main content area, titled "Tree", shows a hierarchical list of employee names:

- ▼ KING
 - ANDREW
- ▼ BLAKE
 - ALLEN
 - JAMES
 - MARTIN
 - TURNER
 - WARD
- ▼ CLARK
 - MILER
- ▼ JONES
 - FORD
- ▼ SMITH
- ▼ SCOTT
- ADAM

At the bottom right of the tree view, there are two buttons: "Collapse All" and "Expand All". The footer of the application includes the text "release 1.0 [Set Screen Reader Mode On](#)" and a utility bar with icons for Home, Application 91534, Edit Page 5, Session, View Debug, Debug, Show Grid, Quick Edit, and Theme Roller.

Пример 7 (как можно
оформлять вызовы процедур)

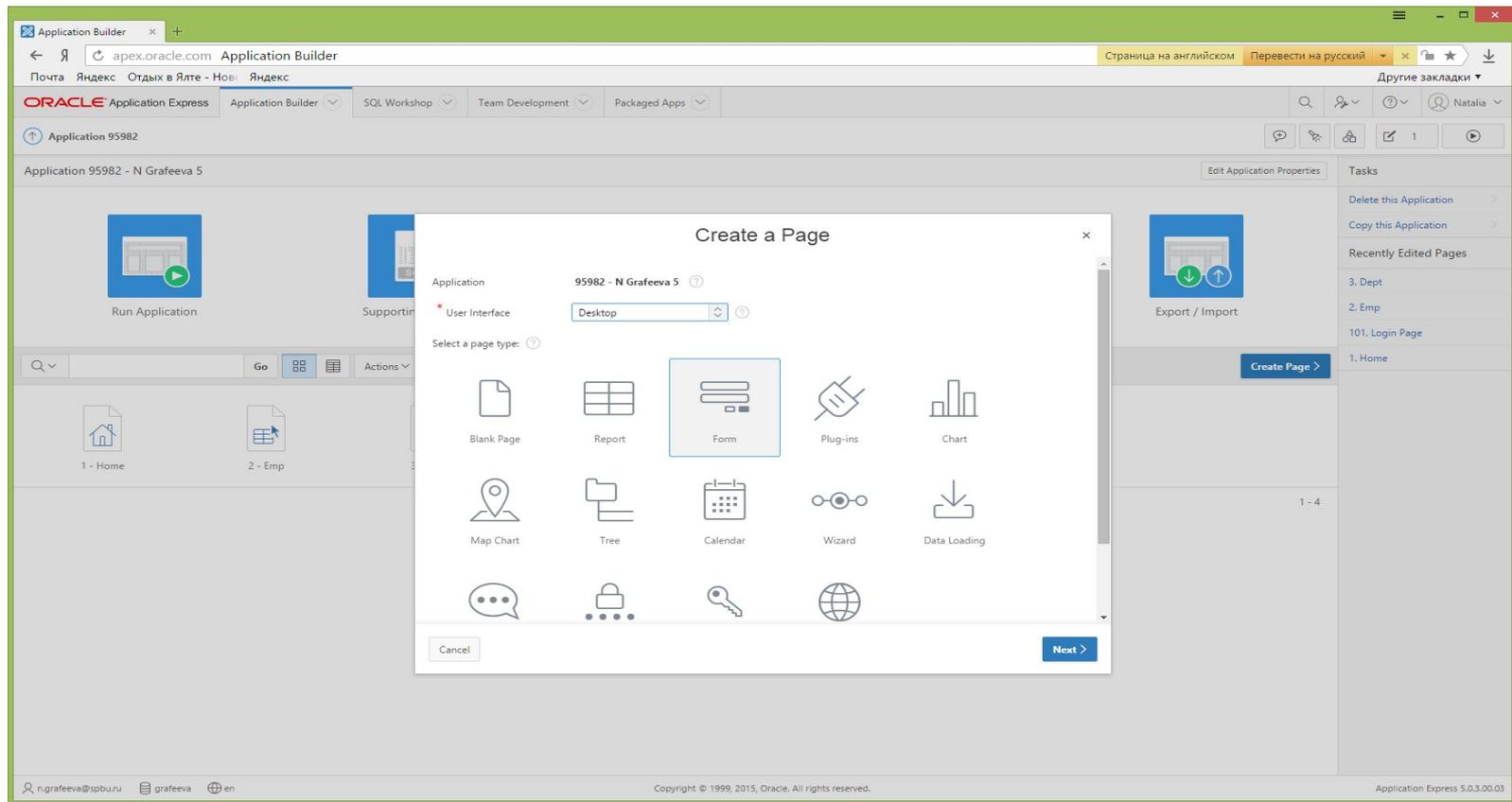
Создадим хранимую процедуру

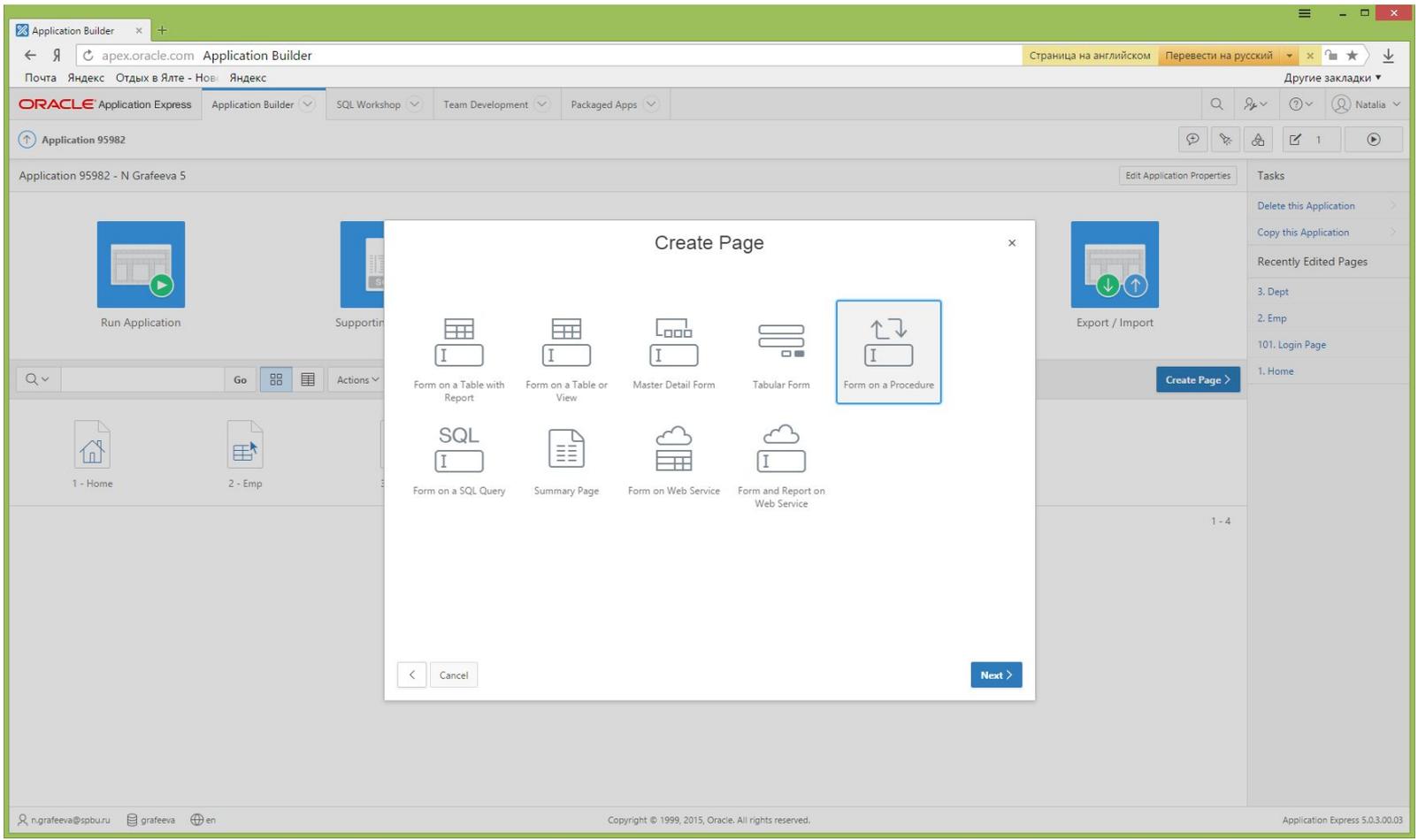
- create or replace procedure ADD_SAL
 (value IN VARCHAR2 default 0)
is
begin

 update EMP set SAL = SAL + value;

end;

Добавим новую страницу типа Form on a Procedure к Приложению 2 (Form -> Form on a Procedure)





Зададим имя хранимой процедуры

Create Form on Procedure ×

Page Attributes

* Page Number

* Page Name

Page Mode Normal Modal Dialog

* Branch Here on Submit

* Cancel and Go To Page

Breadcrumb

Создадим пункт меню для вызова процедуры

Create Form on Procedure ×

Navigation Menu

Navigation Preference

Do not associate this page with a navigation menu entry ?

Create a new navigation menu entry

Identify an existing navigation menu entry for this page

* New Navigation Menu Entry ?

Parent Navigation Menu Entry

- No parent selected - ?

Home

Emp

< Cancel Next >

Уточним имя процедуры и значение параметра по умолчанию для процедуры

Create Form on Procedure ×

Progress: ✓ ✓ ● Source

* Procedure Owner: ?

* Stored Procedure Name: ^ ?

Select procedure arguments to be included in form:

Include	Argument	Label	Default	Display Type
<input type="text" value="Yes"/> ▼	VALUE	<input type="text" value="Value"/>	<input type="text" value="0"/>	<input type="text" value="Text Field"/> ▼

1 - 1

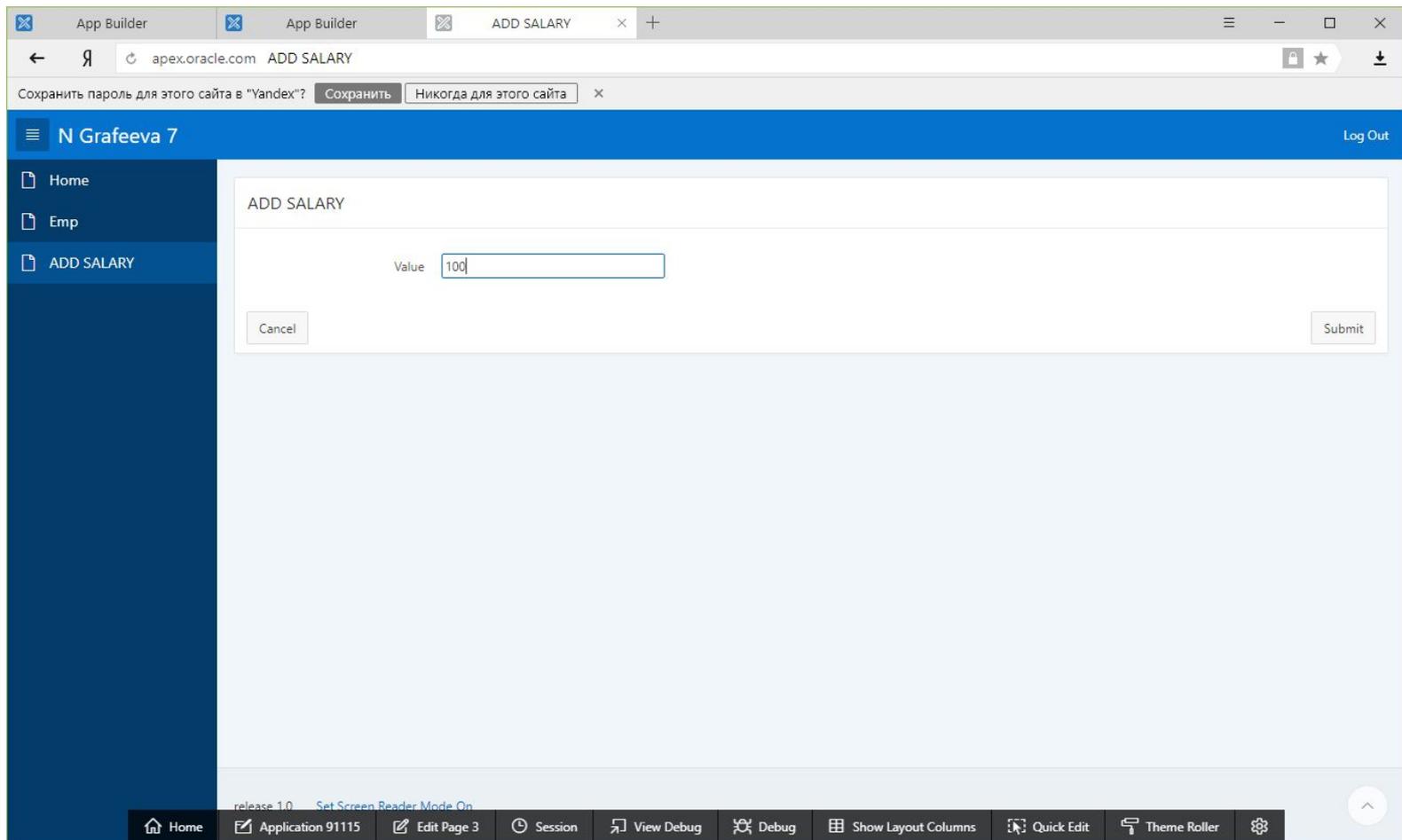
Вот как выглядит приложение

The screenshot displays a web browser window with three tabs: 'App Builder', 'App Builder', and 'Emp'. The address bar shows 'apex.oracle.com Emp'. A notification bar asks to save the password for 'Yandex?'. The application header is blue with the user name 'N Grafeeva 7' and a 'Log Out' link. A dark blue sidebar on the left contains navigation items: 'Home', 'Emp', and 'ADD SALARY'. The main content area is titled 'Emp' and features a search bar, a 'Display' dropdown set to '15', and a 'Go' button. Below this is a table with the following data:

Empno ↑	Ename	Job	Mgr	Hiredate	Sal	Comm	Deptno
7369	SMITH	CLERK	7902	17-DEC-80	777		20
7499	ALLEN	SALESMAN	7698	20-FEB-81	1577	300	30
7521	WARD	SALESMAN	7698	22-FEB-81	1227	500	30
7566	JONES	MANAGER	7839	02-APR-81	2952		20
7654	MARTIN	SALESMAN	7698	28-SEP-81	1227	1400	30
7698	BLAKE	MANAGER	7839	01-MAY-81	2827		30
7782	CLARK	MANAGER	7839	09-JUN-81	2427		10
7788	SCOTT	ANALYST	7566	09-DEC-82	7492		20
7839	KING	PRESIDENT		17-NOV-81	4977		10
7844	TURNER	SALESMAN	7698	08-SEP-81	1477	0	30
7876	ADAM	CLERK	7788	12-JAN-83	1077		20
7900	JAMES	CLERK	7698	03-DEC-81	927		30
7902	FORD	ANALYST	7566	03-DEC-81	2992		20
7934	MILER	CLERK	7782	23-JAN-82	1277		10
8020	ANDREW	MANAGER	7839	01-FEB-16	5007		10

The bottom of the browser window shows a dark toolbar with icons for 'Home', 'Application 91115', 'Edit Page 2', 'Session', 'View Debug', 'Debug', 'Show Layout Columns', 'Quick Edit', 'Theme Roller', and a settings gear icon.

Задаются фактические параметры для вызова процедуры



А вот результаты вызова...

The screenshot shows a web browser window displaying an Oracle APEX application. The browser tabs include 'App Builder', 'App Builder', and 'Emp'. The address bar shows 'apex.oracle.com Emp'. The application header displays the user 'N Grafeeva 7' and a 'Log Out' link. A left sidebar contains navigation items: 'Home', 'Emp', and 'ADD SALARY'. The main content area is titled 'Emp' and features a search bar and a 'Go' button. Below this is a table with 8 columns: Empno, Ename, Job, Mgr, Hiredate, Sal, Comm, and Deptno. The table contains 16 rows of employee data. At the bottom, a dark navigation bar includes icons for Home, Application 91115, Edit Page 2, Session, View Debug, Debug, Show Layout Columns, Quick Edit, and Theme Roller.

Empno	Ename	Job	Mgr	Hiredate	Sal	Comm	Deptno
7369	SMITH	CLERK	7902	17-DEC-80	877		20
7499	ALLEN	SALESMAN	7698	20-FEB-81	1677	300	30
7521	WARD	SALESMAN	7698	22-FEB-81	1327	500	30
7566	JONES	MANAGER	7839	02-APR-81	3052		20
7654	MARTIN	SALESMAN	7698	28-SEP-81	1327	1400	30
7698	BLAKE	MANAGER	7839	01-MAY-81	2927		30
7782	CLARK	MANAGER	7839	09-JUN-81	2527		10
7788	SCOTT	ANALYST	7566	09-DEC-82	7592		20
7839	KING	PRESIDENT		17-NOV-81	5077		10
7844	TURNER	SALESMAN	7698	08-SEP-81	1577	0	30
7876	ADAM	CLERK	7788	12-JAN-83	1177		20
7900	JAMES	CLERK	7698	03-DEC-81	1027		30
7902	FORD	ANALYST	7566	03-DEC-81	3092		20
7934	MILER	CLERK	7782	23-JAN-82	1377		10
8020	ANDREW	MANAGER	7839	01-FEB-16	5107		10

Заключение

- Возможностей в APEX Application Builder очень много. Рассмотреть в рамках данного курса практически невозможно. Мы рассмотрели 2-3% из них. И тем не менее, этого достаточно, чтобы создавать незатейливые приложения по разнообразным поводам.

Домашнее задание 5

- Создайте приложение, которое объединит все 7 заданий, упомянутых в презентации.

Результат (ссылку на приложение, логин и пароль для входа) отправьте по адресу N.Grafeeva@spbu.ru. Тема письма – DB_Application_2017_job5.

Примечание: задание должно быть отправлено в течение 14 дней. За более позднее отправление будут сниматься штрафные баллы (по баллу за каждые две недели).

Литература

1. John Edward Scott and Scott Spendolini, Pro Oracle Application Express
2. http://docs.oracle.com/cd/E14373_01/index.htm(документация)