

Solution Engineer Assisted Workshop Day

Lab 03.2 – APEX

V1.2

ORACLE LAB BOOK | JANURARY 2019

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Overview

Application Express enables you to design, develop and deploy beautiful, responsive, database-driven applications using only your web browser. Application Express has been a fully supported and no-cost feature of the Oracle Database. Using Application Express as a platform, customers can create applications that range from small opportunistic solutions to enterprise-wide mission critical systems.

Application Express has following main features

- Fully supported by Oracle.
- No cost feature of the Oracle Database.
- Included with Oracle Database since 2004.
- Runs wherever the Oracle Database runs.
- Can exploit all features of Oracle Database.
- Scales with the Oracle Database.

Application Express can easily be used by citizen developers, yet it is broad enough to be exploited by experienced enterprise developers. This enables developers to build small opportunistic solutions all the way up to complex enterprise-wide mission critical systems.

The Oracle Application Express engine runs directly in the Oracle Database and exploits the database's extraordinarily scalable and efficient architecture. You can also take full advantage of improved performance with Exadata, Real Application Clusters (RAC), and the In-Memory option.

The Oracle Application Express framework provides numerous security features out-of-the-box. Authenticate your users using LDAP, Oracle Single-signon, Oracle Database credentials, or HTTP Header variable. Exploit database features like Virtual Private Database and Real Application Security.

This demo aims at displaying the rapid application development capabilities of Oracle Application Express. It includes an overview of APEX tool on Oracle Database Cloud, creating a workspace and also you will create a simple application using Oracle Application Express.

Acronyms

The following acronyms are used in this workbook.

DB	Oracle Database
APEX	Oracle Application Express
ID	Identifier
OS	Operating System



Pre-Requisites

1. Oracle Cloud Infrastructure account credentials (User, Password, and Tenant)
2. SSH Keys generated for compute SSH access.
3. User access to you must have the Compute_Operations role.

Sign into tenancy:

Access the Tenancy Welcome Email using this link:

<http://10.136.208.135/shares/export/nas/pcm/ocm#O/t#TWelcome.html>

Where #O is the OCC and #T is the tenancy.

Practice 3-1: Launch APEX on Cloud and its Overview

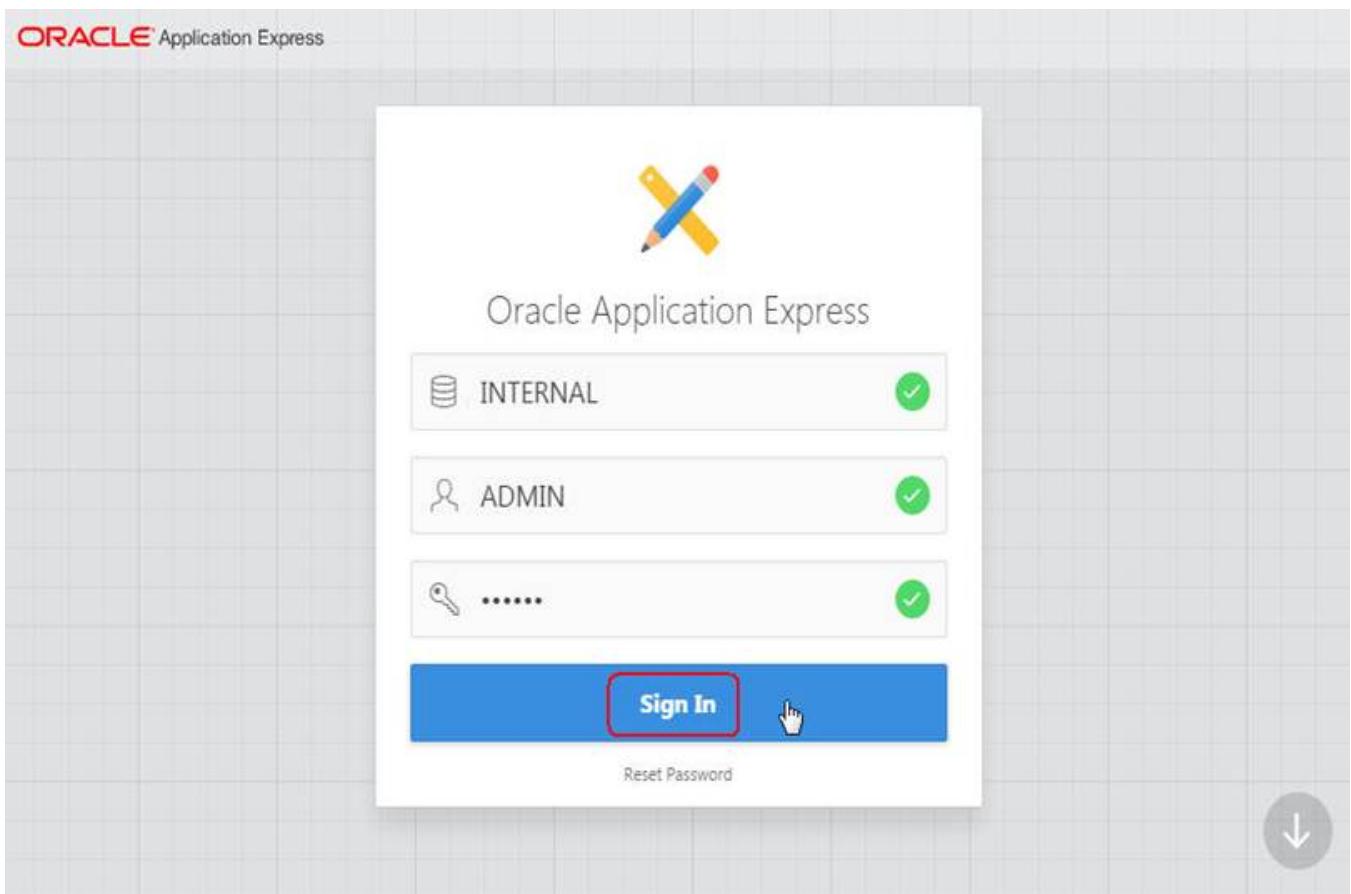
Overview

In this demo, we will start Application express from a cloud account. Once logged into application express, we will explore the features which enables developers to build small opportunistic solutions as well as complex enterprise-wide mission critical systems.

1. Click on Hamburger sign menu on the right of your provisioned instance called ORCL12c.
 - a. Please make sure the security rule is enabled for launching Application Express Console.
 - b. To enable a security rule, please see the previous lab to enable security rule.
 - c. **Click “Open Application Express”.**

Version: 12.1.0.2 Edition: Enterprise Edition - Extreme Performance	ORCL11g Version: 11.2.0.4 Edition: Enterprise Edition - Extreme Performance	ORCL12c Version: 12.1.0.2 Edition: Enterprise Edition - Extreme Performance
	Created On: May 11, 2016 10:15:40 PM UTC	Created On: May 11, 2016 10:15:33 PM UTC
		<p>Memory: 30 GB Open DBaaS Monitor Console Open Application Express Console (highlighted) Open GlassFish Administration Console Open EM Console SSH Access Access Rules Delete</p> <p>Memory: 7.5 GB Storage: 102 GB</p>

2. Enter the following:
 - a. Workspace: INTERNAL
 - b. Username: ADMIN
 - c. Password: <is admin password used while creating the DBCS service> e.g. “Welcome1”



Navigation

The following steps is to only navigate the APEX. **Please do not click on any of the “create” buttons.** This screen is the Application Express. This is an application which is capable of creating applications at rapid speed.

We have logged in to APEX using the inbuilt user “ADMIN”, and in an inbuilt existing workspace “INTERNAL”. INTERNAL workspace is used to do APEX administration activities

1. Hover over to Create Application.

- We can directly go to create workspace page by clicking on the blue button “Create Workspace” on top left side. For creating an application, we need to have minimum of one workspace attached to it.

The screenshot shows the Oracle Application Express Instance Administration interface. At the top, there's a navigation bar with links for Manage Requests, Manage Instance, Manage Workspaces, and Monitor Activity. On the far right, there's a user dropdown for 'ADMIN'. Below the navigation bar, the main area is titled 'Instance Administration'. It features four main icons: 'Manage Requests' (with a plus sign), 'Manage Instance' (with a gear), 'Manage Workspaces' (with a yellow cylinder), and 'Monitor Activity' (with a bar chart). To the right of these icons is a sidebar titled 'Administration' with a sub-section for 'Create Workspace'. A red box highlights the 'Create Workspace' button. Below the sidebar, there's a 'System Message' section with a table showing pending requests and workspace summary statistics. The 'Pending Requests' table includes rows for 'Provisioning Mode: Self-Service Provisioning', 'New Service' (0), and 'Service Change' (0). The 'Workspace Summary' table includes rows for 'Workspaces' (4), 'Schemas' (4), 'Applications' (30), 'Users' (8), 'Mail Queue Entries' (0), and 'Websheets' (0). At the bottom, there's a 'Jobs' section listing maintenance tasks like 'ORACLE_APEX_DAILY_MAINTENANCE' and 'ORACLE_APEX_MAIL_QUEUE'.

2. Point to “Create User”

- Similarly, we can go to create user page by clicking on the link “Create User” on the right menu page.

The screenshot shows the Oracle Application Express Instance Administration interface. At the top, there are tabs for Manage Requests, Manage Instance, Manage Workspaces, and Monitor Activity. On the right, a blue sidebar menu is open under the 'Administration' section. The 'Create User' link is highlighted with a red box. Other visible links in the sidebar include Create Workspace, Provisioning, Manual, Instance Tasks, Feature Configuration, Security, Instance Settings, Workspace Purge Settings, Workspace Tasks, Create Workspace, Create Multiple Workspaces, Find a Workspace, Reset User Password, and Available Updates.

3. Click on “Security”. To get an idea of the security features we will click on the security link on the right blue menu screen.

- On Security screen we can see that we can set password policy, session timeout, and many other security features for the application.
- Click on “Oracle Application Express” to return to the application.

This screenshot is identical to the one above, showing the Instance Administration page of Oracle Application Express. The blue sidebar menu is open at the 'Administration' level, and the 'Security' link is highlighted with a red box, indicating it has been clicked. The rest of the menu items and system message area are visible.

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4. Click on “Feature Configuration”

- a. Another capability on which we will give a quick look is “Feature Configuration”.
- b. We can enable or disable features for the applications. For further information on each feature we can click on the help (?) button on the right side of each feature.
- c. Click on “Oracle Application Express” to go back to the application.

The screenshot shows the Oracle Application Express Instance Administration interface. At the top, there are tabs for Manage Requests, Manage Instance, Manage Workspaces, and Monitor Activity. Below these are four main icons: Manage Requests (database with plus), Manage Instance (database with gear), Manage Workspaces (database with chart), and Monitor Activity (chart). A 'Create Workspace' button is located in the top right. On the left, a 'System Message' section displays 'Pending Requests' (0) and 'Provisioning Mode: Self-Service Provisioning'. On the right, a sidebar titled 'Administration' contains sections for Provisioning, Manual, and Instance Tasks. Under Instance Tasks, the 'Feature Configuration' link is highlighted with a red box and a cursor icon. Other links in this section include Security, Instance Settings, Workspace Purge Settings, Workspace Tasks, and Create Workspace.

** This concludes the brief overview of Application Express. Next we will create a workspace and its users.

Practice 3-2: Create Workspace and Create User

1. Click on Create Workspace.

The screenshot shows the Oracle Application Express Instance Administration interface. At the top, there are navigation tabs: Manage Requests, Manage Instance, Manage Workspaces, and Monitor Activity. On the right, there's a sidebar titled 'Administration' with options like Provisioning, Feature Configuration, Security, Instance Settings, Workspace Purge Settings, and Workspace Tasks. A prominent red box highlights the 'Create Workspace' button in the top right corner of the main content area. Below the buttons, there are four icons: Manage Requests, Manage Instance, Manage Workspaces, and Monitor Activity. The 'Manage Workspaces' icon is selected. The 'System Message' section shows pending requests and workspace statistics. The workspace summary table includes columns for Workspaces (4), Schemas (4), Applications (30), Users (8), and Mail Queue Entries (0).

2. Fill in the following:

- a. **Workspace Name:** demo
- b. **Workspace ID:** <leave blank>
- c. **Workspace Description:** "Demo Work-space for simple application"
- d. Click "**Next**"
- e. **Re-use existing schema:** No
- f. **Schema Name:** demo
- g. **Schema Password:** demo
- h. **Space Quota (MB):** 100MB
- i. Click "**Next**"
- j. **Administrator Username:** demo_admin
- k. **Administrator Password:** <enter a password e.g. Welcome1>
- l. **Email:** demo_admin@company.com
- m. Click "**Next**"

3. On this screen we can verify the details then click "Create Workspace". We have created workspace, its associated schema, and workspace admin for the newly created workspace. Now will click done.

The screenshot shows the Oracle Application Express workspace creation process in two steps:

Step 1: Identify Workspace

This step allows you to define basic workspace details:

- Workspace Name:** demo (marked with a red asterisk)
- Workspace ID:** (empty field)
- Workspace Description:** Demo work-space for simple application

Tasks: Create Multiple Workspaces

Buttons: Cancel, Next > (highlighted with a red box)

Step 2: Identify Schema

This step allows you to define schema details:

- Re-use existing schema?**: No (dropdown menu)
- Schema Name:** demo (marked with a red asterisk)
- Schema Password:** (redacted)
- Space Quota (MB):** 100 (dropdown menu)

Buttons: <, Cancel, Next > (highlighted with a red box)

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ORACLE Application Express

Manage Requests ▾ Manage Instance ▾ Manage Workspaces ▾ Monitor Activity ▾

Manage Workspaces > Create Workspace

Create Workspace

Identify Administrator

* Administrator Username: demo_admin

* Administrator Password: ****

First Name:

Last Name:

* Email: demo_admin@company.com

< Cancel Next >

Next > (button highlighted with a red box)

ORACLE Application Express

Manage Requests ▾ Manage Instance ▾ Manage Workspaces ▾ Monitor Activity ▾

Manage Workspaces > Create Workspace

Create Workspace

Confirm Request

You have requested to provision a new Workspace.

Workspace Information:

Name	demo
Workspace ID	System Assigned
Description	Demo user...

Administrator Information:

User Name	demo_admin
E-mail	demo_admin@company.com

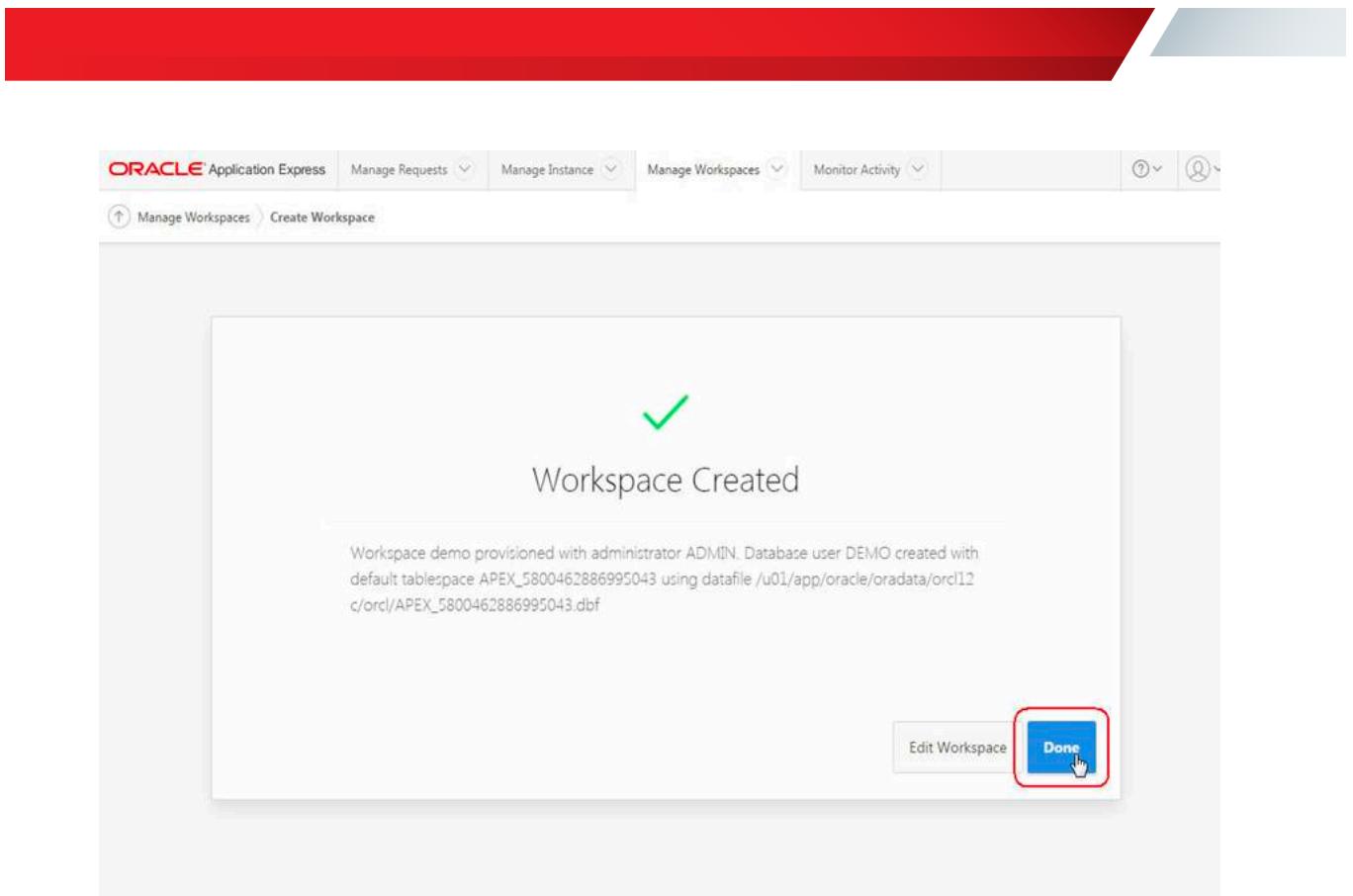
Schema Information:

Reuse Existing Schema	No
Schema Name	DEMO
Tablespace will be created	APEX_XXX
Datafile for tablespace	/u01/app/oracle/oradata/orcl12c/orcl/APEX_XXX.DBF

< Cancel Create Workspace

Create Workspace (button highlighted with a red box)

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Create User

1. Click “ORACLE Application Express” to go to home and click create user.

A screenshot of the Oracle Application Express Instance Administration page. The top navigation bar is identical to the previous screenshot. On the left, there are four main navigation icons: 'Manage Requests', 'Manage Instance', 'Manage Workspaces', and 'Monitor Activity'. To the right of these is a 'Create Workspace' button. A vertical sidebar on the right contains sections for 'Administration', 'Provisioning', 'Manual', and 'Instance Tasks'. Under 'Instance Tasks', there are several options: 'Feature Configuration', 'Security', 'Instance Settings', 'Workspace Purge Settings', 'Workspace Tasks', 'Create Workspace' (which is highlighted with a red rectangle), 'Create Multiple Workspaces', 'Find a Workspace', and 'Manage Workspaces'. At the bottom of the sidebar, there are three more buttons: 'Create User' (highlighted with a red rectangle), 'Find a User', and 'Reset User Password'. The main content area below the sidebar shows 'System Message' and 'Pending Requests' sections, along with a summary of system status (0 New Service, 0 Service Change). The bottom of the page features the Oracle logo.

2. Enter the following:

- a. Username: demo_dev
- b. Email: demo_dev@company.com
- c. Workspace: demo
- d. Default schema: demo
- e. User is an administrator: No
- f. User is a developer: Yes
- g. Password: enter password for demo_dev (Good idea to use 1 password for all accounts in 1 demo.) e.x. Welcome123#
- h. Require change of password on first user: No

3. Once the create user is clicked then the screen will show a success message for user creation.

User Attributes

* Username:	demo_dev	(?)
* Email Address:	demo_dev@company.com	(?)
First Name:		(?)
Last Name:		(?)
Description:		
(?)		
Default Date Format:	fmDay, fmDD fmMonth, YYYY	(?)

Account Privileges

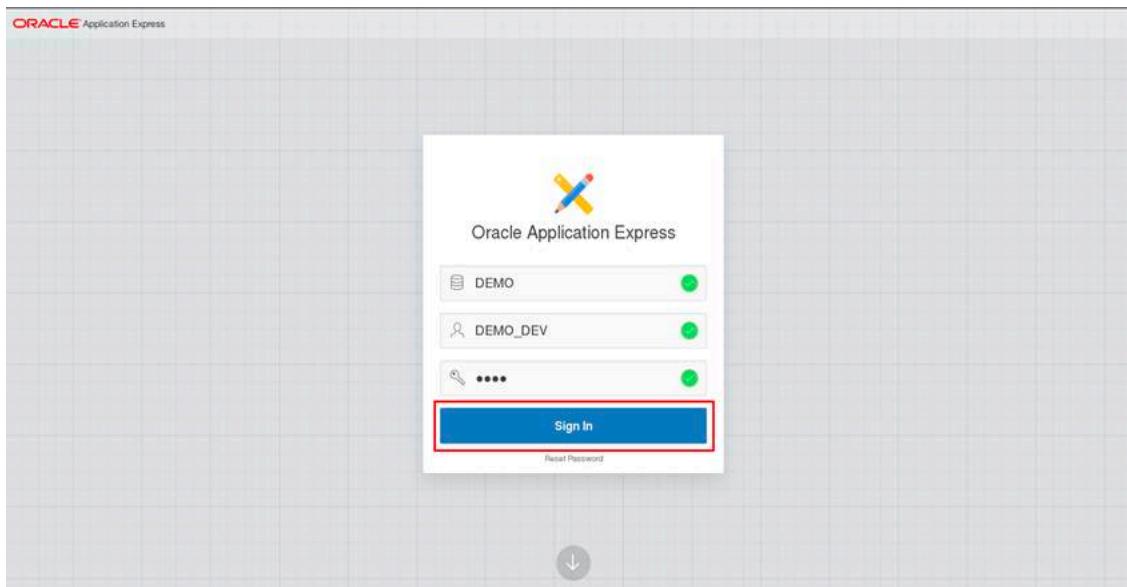
* Workspace:	DEMO (5830330421217830)	(?)
Default Schema:	DEMO	(?)
Accessible Schemas (null for all):		(?)
User is an administrator:	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/>	(?)
User is a developer:	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/>	(?)
Application Builder Access:	Yes	(?)
SQL Workshop Access:	Yes	(?)
Team Development Access:	Yes	(?)
Account Availability:	Unlocked	(?)

Password

Password:	****	Passwor
Confirm Password:	****	(?)
Require Change of Password on First Use:	No	(?)

Practice 3-3: Using SQL Workshop to Load Data into a Table

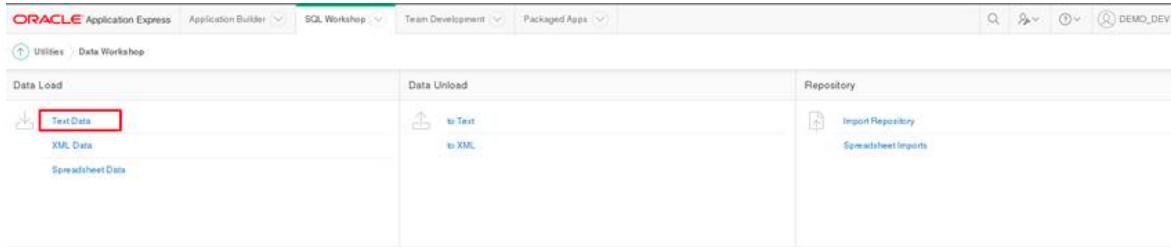
1. Login to the cloud APEX as shown previously using the credentials for the new user e.g.:
 - a. Workspace: DEMO
 - b. Username: demo_dev
 - c. Password: Password used while creating the instance.



2. Click SQL Workshop. Select Utilities > Data Workshop.

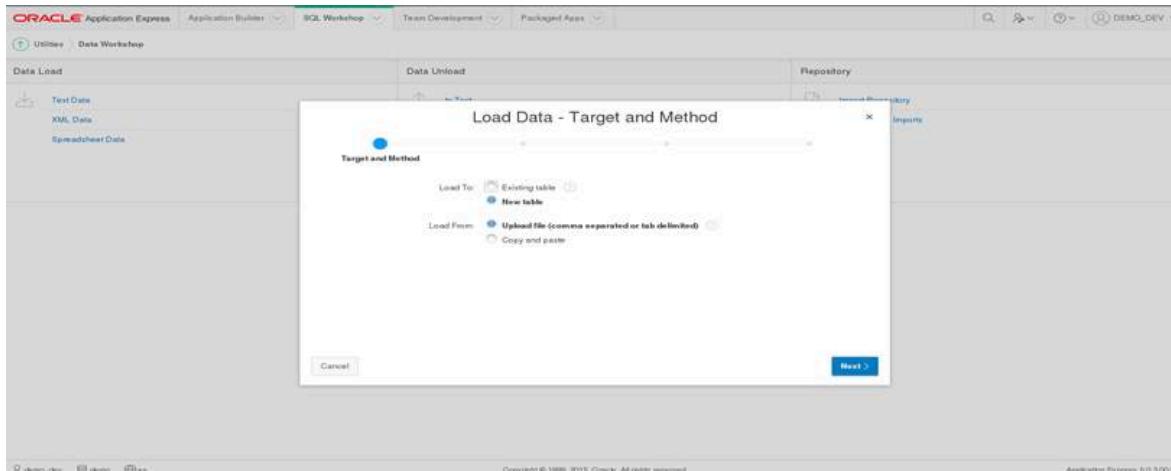
A screenshot of the Oracle Application Express dashboard. The top navigation bar includes tabs for "Application Builder", "SQL Workshop" (which is currently selected and highlighted in blue), "Team Development", and "Packaged Apps". Below the navigation bar is a sidebar with icons for "Application Builder", "Object Browser", "SQL Commands", "SQL Scripts", "Utilities" (which is expanded to show "All Utilities" and "Data Workshop"), "RESTful Services", "Query Builder", "Generate DDL", "User Interface Defaults", "Methods on Tables", "About Database", "Object Reports", "Database Monitor", "Schema Comparison", and "Recycle Bin". The main content area shows "Top Applications" and "Top Users" sections. On the right side, there is a "Dashboard" summary with counts for "Applications" (1) and "Tables" (12). Further down, there are sections for "Available Updates", "System is up-to-date", "Accessibility Mode", and "Standard". The bottom right corner features the "ORACLE" logo.

3. Under Data Load, select Text Data.



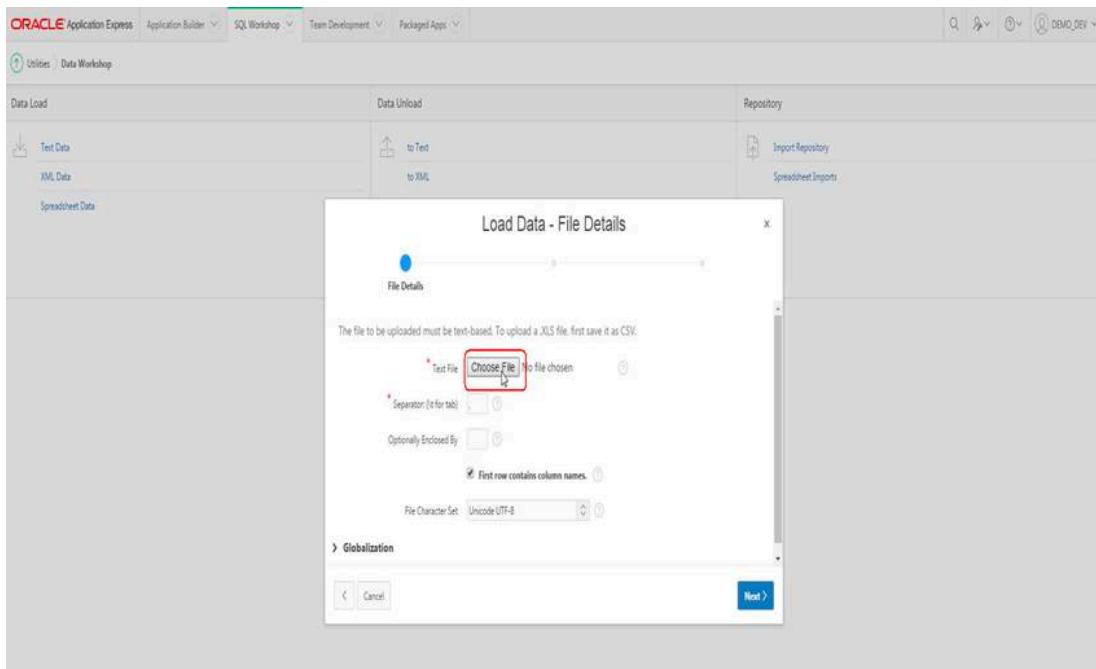
The screenshot shows the Oracle Application Express interface with the 'Data Workshop' tab selected. In the 'Data Load' section, the 'Text Data' option is highlighted with a red box. Other options like 'XML Data' and 'Spreadsheet Data' are also listed. The 'Data Upload' and 'Repository' sections are visible to the right.

4. To upload a file and load it into a new Orders table, select New Table for Load To and click Next >



The screenshot shows the 'Load Data - Target and Method' dialog. Under the 'Target and Method' section, the 'Load To' dropdown is set to 'New table'. Other options include 'Existing table' and 'Upload file (comma separated or tab-delimited)'. The 'Next >' button is visible at the bottom right of the dialog.

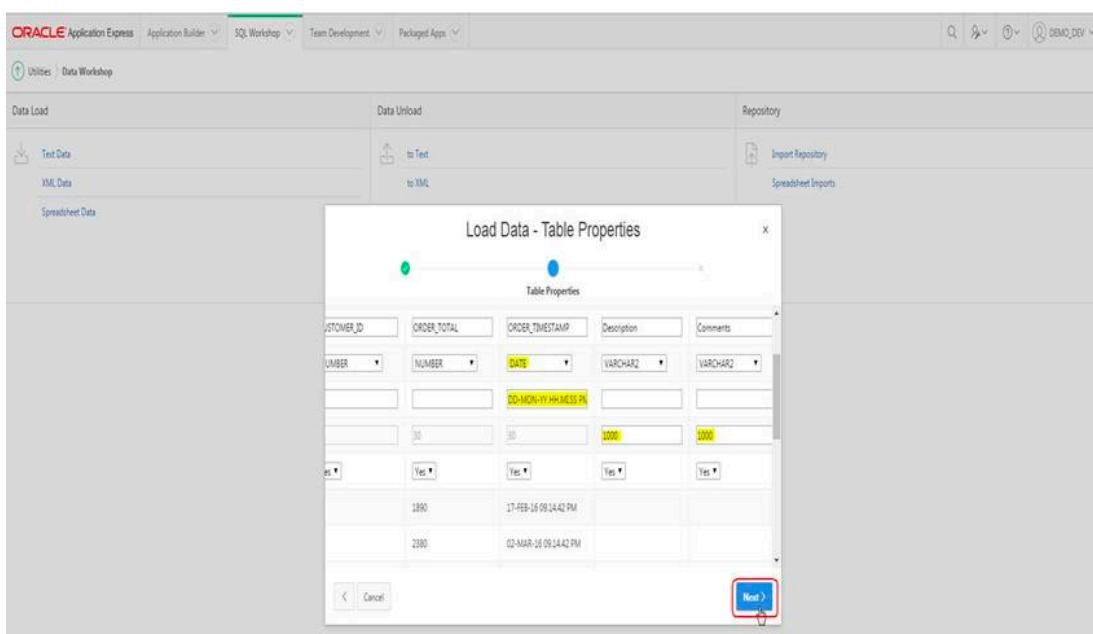
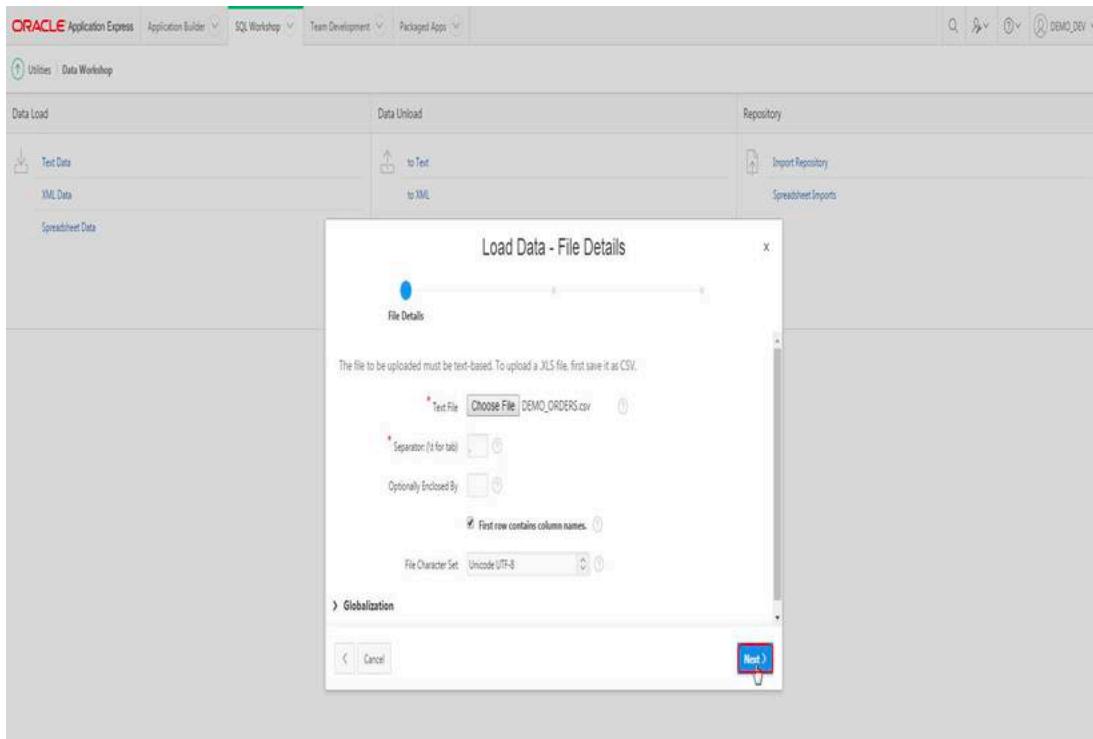
5. Click Browser and select /nas/pcm/workshop/artifacts/Manual_Orders.csv file.



The screenshot shows the 'Load Data - File Details' dialog. It includes fields for 'File Details', 'Separator (| for tab)', 'Optional Enclosed By', 'First row contains column names', and 'File Character Set' (set to 'Unicode UTF-8'). The 'Choose File' button, which is used to select the CSV file, is highlighted with a red box. The 'Next >' button is visible at the bottom right of the dialog.

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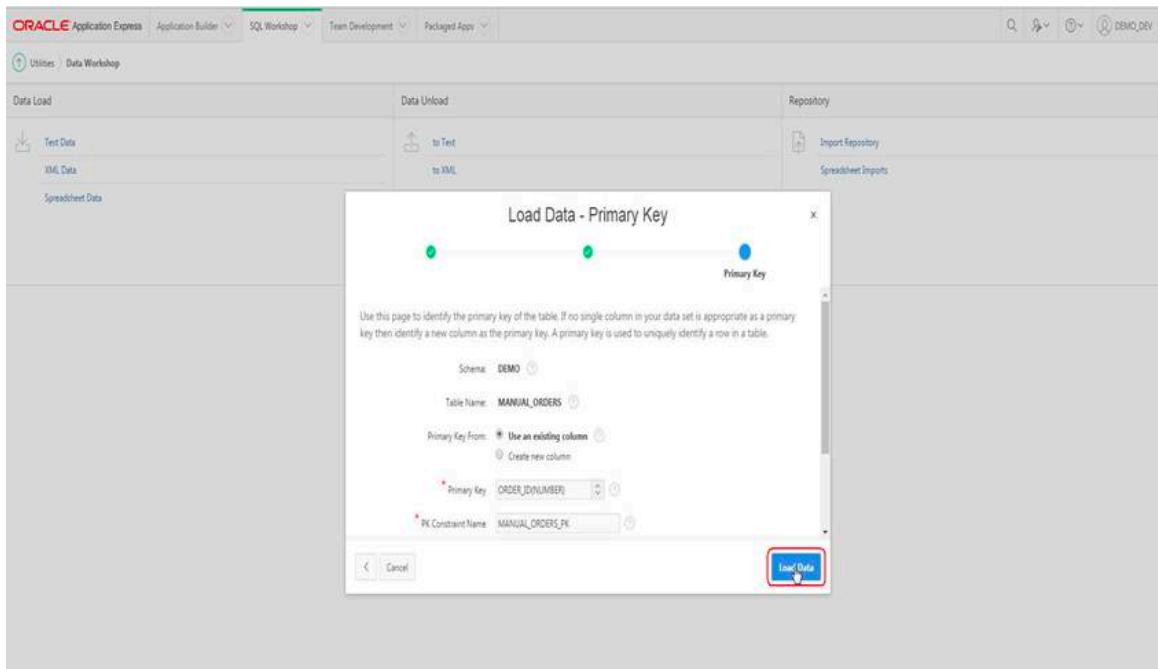
6. The file is tab delimited. Change Separator to ‘,’ and click Next >
- The column mapping information is displayed. We will check format for date columns, and verify the length of text columns.
 - Enter Table Name as MANUAL_ORDERS and click Next.



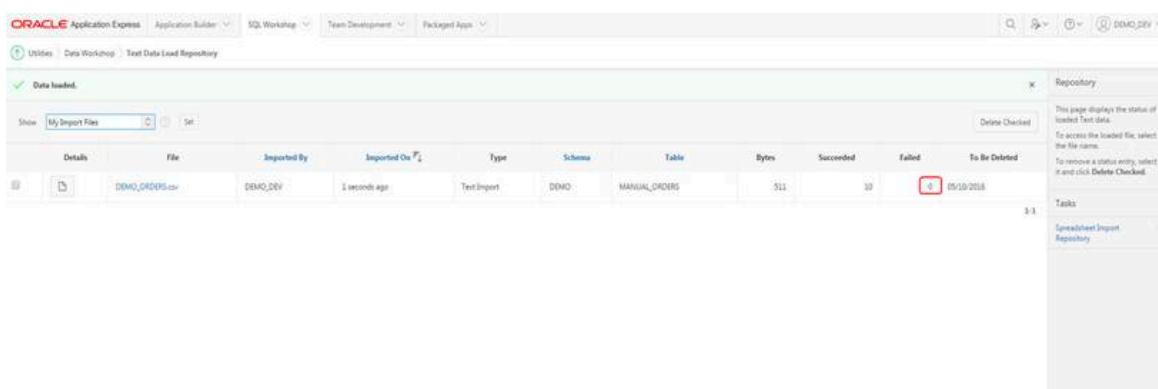
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7. Primary Key: Select: use an existing column for primary key. Select the following:

- a. "Use an existing column"
- b. Primary Key: order_id
- c. PK Constraint name: MANUAL_ORDERS_PK
- d. Click Load Data



8. Check to see the data was loaded successfully; in case of failed rows we can click on it and check the reasons.



9. Click on SQL Workshop then SQL Commands. Verify the data in the new created MANUAL_ORDERS table.

10. Enter the DWL command and check if all records are present in the new table and data load was successful:

- Select * from DEMO.MANUAL_ORDERS
- Click run

ORDER_ID	CUSTOMER_ID	ORDER_TOTAL	ORDER_TIMESTAMP	DESCRIPTION	COMMENTS	STATUS	USER_NAME	TAGS
1	7	1890	02/17/2016	-	-	-	DEMO	-
2	1	2380	03/02/2016	-	-	-	DEMO	LARGE ORDER
3	2	1640	03/13/2016	-	-	-	DEMO	-
4	5	1090	03/15/2016	-	-	-	DEMO	-
5	6	950	03/25/2016	-	-	-	DEMO	-
6	3	1515	03/30/2016	-	-	-	DEMO	-
7	3	905	04/04/2016	-	-	-	DEMO	-

Practice 3-4: Create Simple Application

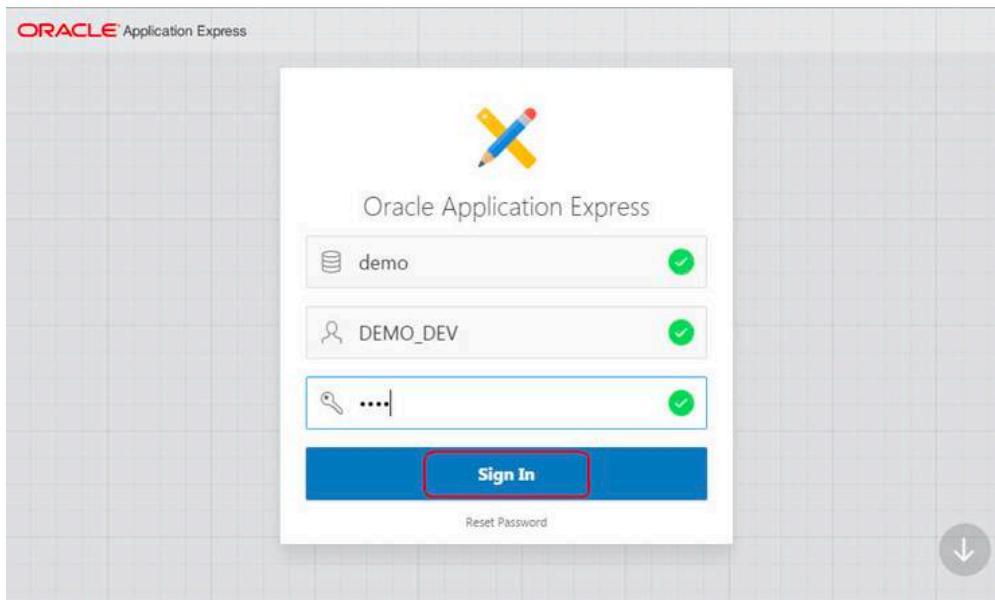
Overview

Demo 1 was an overview of the administration workspace of APEX. In Demo 2 we created an application workspace, its admin, and its developer. In demo 3, we have uploaded a spread sheet data.

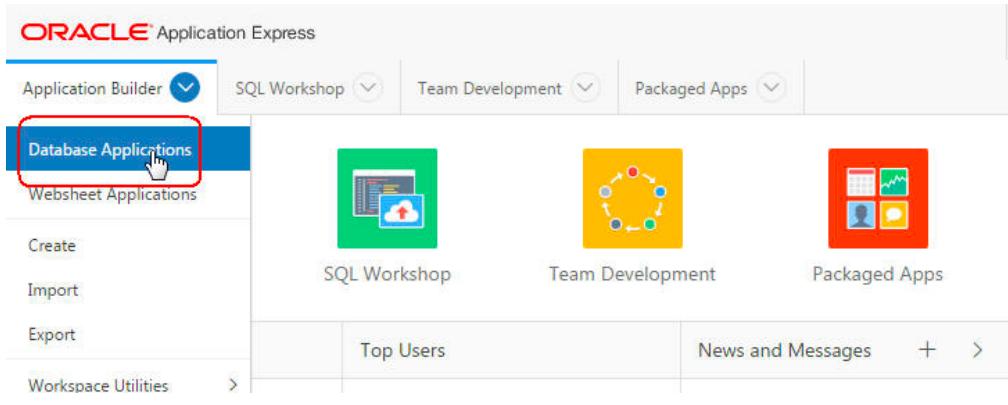
In this demo we will create a simple application using existing sample tables of APEX schema. We all have faced a scenario where one excel sheet have to be updated by multiple people. Either all of them will updates their rows and will sent the excel file to one person who merges the rows. Or the excel file is kept at a shared location and people have to wait for others to release the lock on the file.

In this demo we will create an application for that excel data in few minutes.

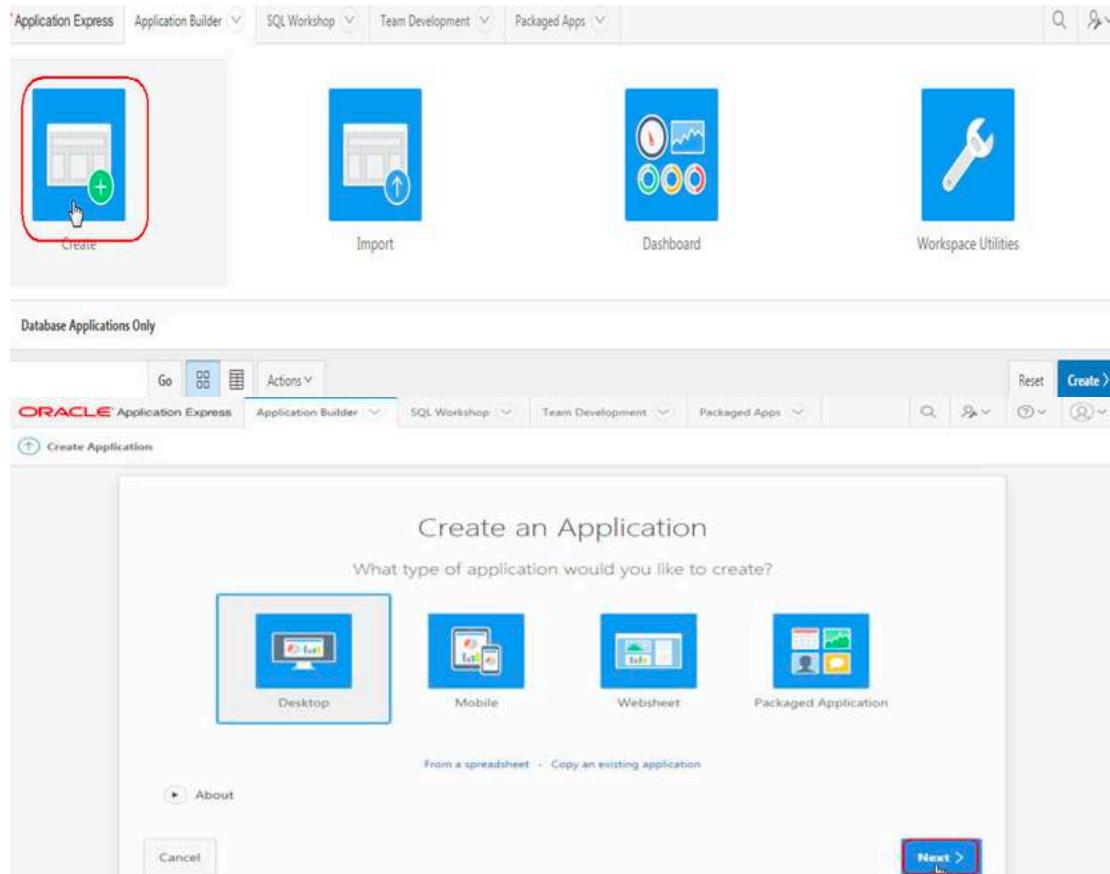
1. Login to APEX using the developer user login to demo workspace. Click Sign In



2. Click on Application Builder on top left then click Database Applications



3. Now we will click Create on the top picture, and then select Desktop in the next screen.



4. Enter the following for the Application Information:

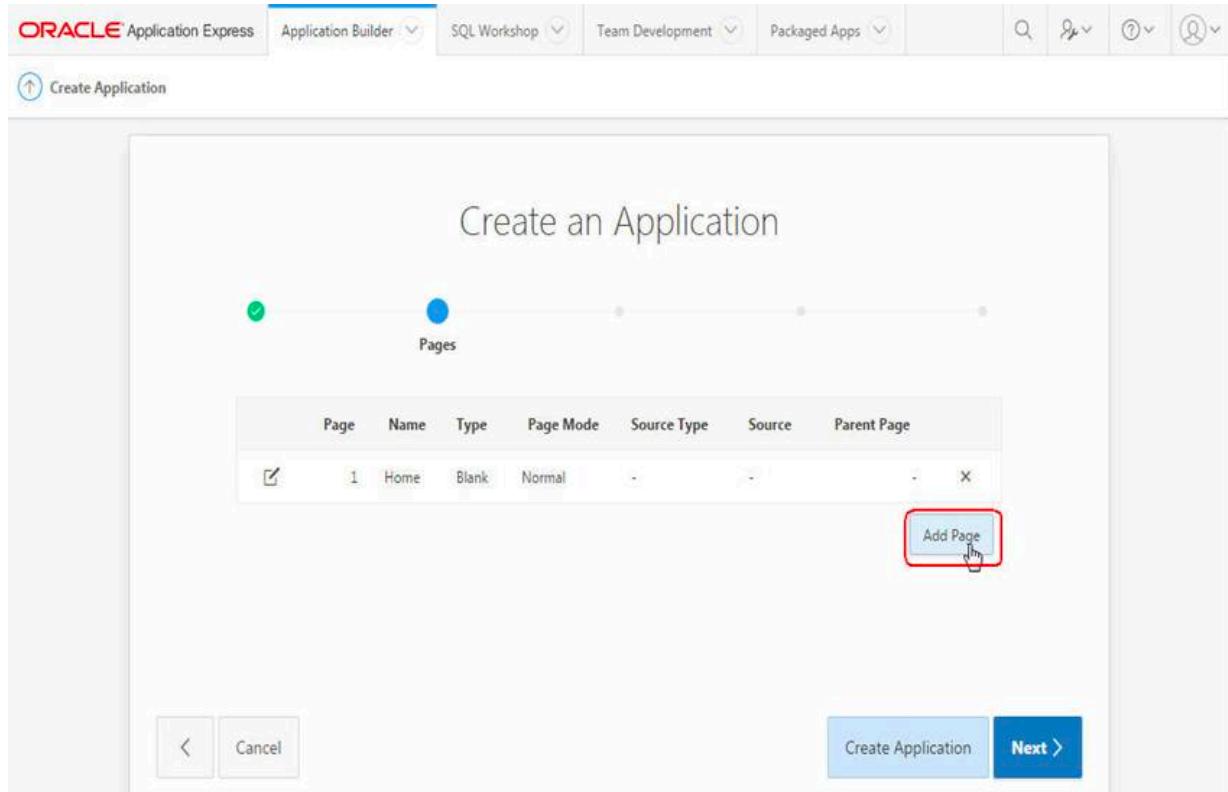
- Name: Simple Demo Application
- Leave rest default

The screenshot shows the 'Create an Application' dialog. On the left, there is a 'Name' section with a blue circular icon. The main form has several fields:

- User Interface:** Desktop
- Schema:** DEMO
- Name:** Simple Demo Application (highlighted with a red box)
- Application:** 103
- Theme:** Universal Theme (42)
- Theme Style:** Vita

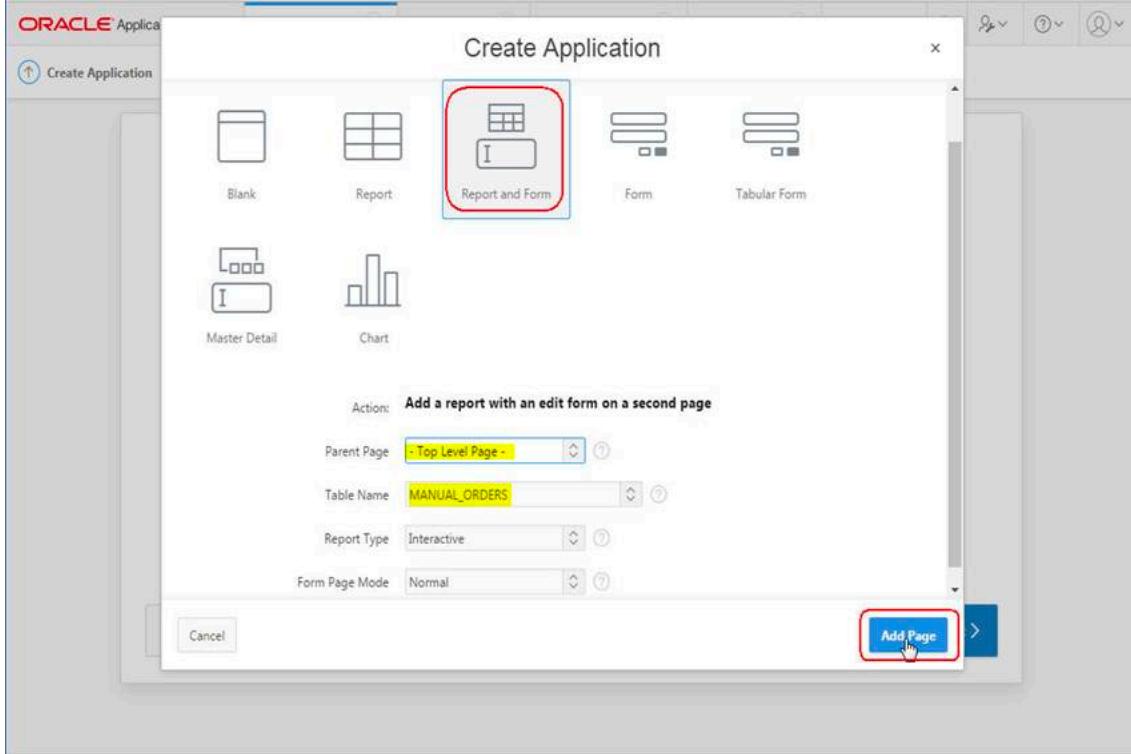
At the bottom right of the dialog is a 'Next >' button, which is highlighted with a red box.

5. By Default, Home page is created simultaneously with the application. We can add other pages into the application by clicking on “Add Page”. Click on Add Page.



6. Enter the following in Create Application:

- a. Select Report and Form.
- b. Parent Page: - Top Level Page –
- c. Table Name: MANUAL_ORDERS
- d. Report Type: Interactive
- e. Form Page Mode: Normal
- f. Click **Add Page**



7. Under pages screen we can see that 2 new pages got added, one is Report and other is Form. Here we will delete the home page by clicking on the x sign after is. Then click next.

Page	Name	Type	Page Mode	Source Type	Source	Parent Page
1	Home	Blank	Normal	-	-	- X
2	Manual Orders	Report	Normal	Table	MANUAL_ORDERS	-
3	Manual Orders	Form	Normal	Table	MANUAL_ORDERS	2 X

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8. Under Shared Components, we will keep the selection as it is on this page and click next.

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 >

9. Under Attributes, we will again keep the selection as it is on this page and click next.

Create an Application

Attributes

Authentication Scheme: Application Express Accounts

Language: English (en)

User Language Preference Derived From: Application Primary Language

Date Format:

Date Time Format:

Timestamp Format:

Timestamp Time Zone Format:

< Cancel Next >

10. Under Confirm, review the details on this page and click Create Application

Create an Application

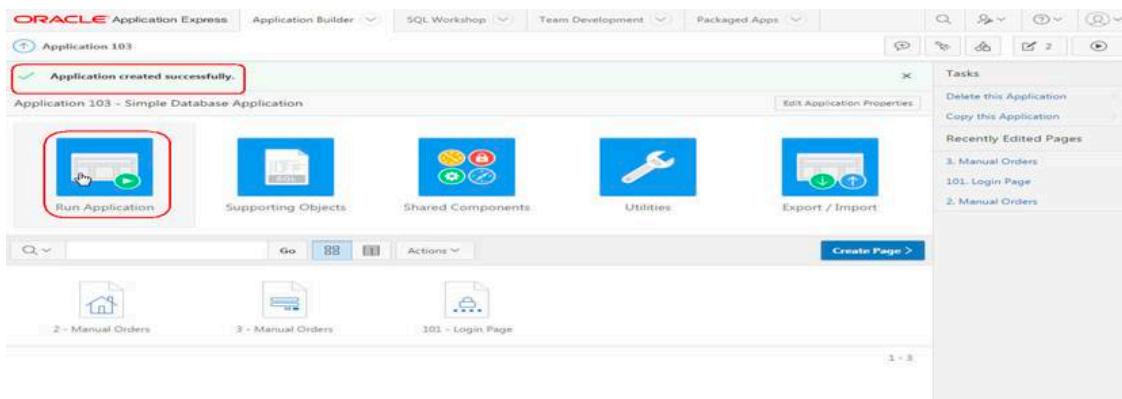
Confirm

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

Application	103
Name	Simple Demo Application
Parsing Schema	DEMO
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

11. The application is created, now we will click on Run Application to test the application.



12. This will prompt you to log in. Use the developer's login:

- Username: demo_dev
- Password: <Password used while creating>
- Click Log In

A screenshot of a 'Log In' page. It has two input fields: 'Username' containing 'demo_dev' and 'Password' containing '****'. Below the password field is a blue 'Log In' button with a white arrow pointing to it.

13. Here we have the application page. Here we can view the data and modify it by clicking the edit sign. Note the URL on top and sent it to people who needs to edit the data.

- We're done! Click log out to finish the workshop.

A screenshot of the 'Manual Orders' application page. At the top, there's a navigation bar with 'Simple Database Application' and 'Log Out'. Below it, a sub-navigation bar shows 'Manual Orders'. The main area is a table with columns: Order Id, Customer Id, Order Total, Order Timestamp, Description, Comments, Status, User Name, and Tags. The first row's 'Edit' icon is highlighted with a red box. The table has 10 rows of data. At the bottom, there are buttons for 'Home', 'Edit Page 2', 'Session', 'View Debug', 'Debug', 'Show Grid', 'Quick Edit', 'Theme Roller', and a 'Logout' button.

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