



# Seminario 2: APEX

DDSI – Curso 2022-2023

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# I. Enunciado del Seminario 2

1. **Estudiar las guías para el curso actual** de las asignaturas del Grado en Ingeniería Informática, y realizar una tabla donde en la primera columna se indiquen nombres de asignaturas, y en la segunda, **nombres de tecnologías, lenguajes y conceptos clave que hemos visto en este Seminario** que aparezcan en el temario de dichas asignaturas (obviando términos generales como Web, Software, Aplicación, etc.). Si no aparece nada, no hay que incluir la asignatura.
2. Estudiar una de las siguientes herramientas Oracle a elegir: Oracle APEX, Oracle Developer Studio, u Oracle ADF mediante JDeveloper. También se admitirá que se realice un estudio de un WAF, previa consulta con el profesor. El estudio consistirá en lo siguiente:

## II. Parte 1. Tabla de Tecnologías del Grado

**Tecnologías que hemos filtrado y buscado:** COBOL, C, C++, Java, Python, Ruby, TCP/IP, HTTP, XML, W3C, Front-End, Back-End, Full-Stack, HTML, Apache, CSS, Javascript, XML, Json, ajax, Framework, middleware, PHP, WAF, angularJS, ReactJS, SQL, SQLDeveloper

Asignatura	Tecnologías que se imparten
Cálculo	-
Fundamentos Físicos y Tecnológicos	-
Fundamentos de programación	C, C++

Fundamentos del Software	C++
Álgebra Lineal y Estructuras matemáticas	Python
Estadística	-
Ingeniería, Empresa y Sociedad	-
Lógica y Métodos Discretos	-
Metodología de la Programación	C,C++
Tecnología y Organización de Computadores	-
Estructura de Datos	C, C++
Programación Orientada a Objetos	Java, Ruby
Sistemas Concurrentes	C++
Sistemas Operativos	C
Estructura de Computadores	C
Inteligencia Artificial	C++
Algorítmica	C++, Python
Fundamentos de Bases de Datos	SQL, SQLDeveloper
Arquitectura de Computadores	C
Fundamentos de Redes	TCP/IP, HTTP, Apache
Ingeniería de Servidores	Apache, PHP, HTTP, Back-End, SQL.
Modelos de Computación	C, C++
Informática Gráfica	C, C++
Diseño y Desarrollo de Sistemas Informáticos	Java, C, C++, Apache, PHP
Aprendizaje Automático (CSI)	Python
Ingeniería del conocimiento (CSI)	C, Python
Metaheurísticas (CSI)	Python
Técnicas de Sistemas Inteligentes (CSI)	
Modelos Avanzados de Computación (CSI)	-
Desarrollo de Sistemas Distribuidos (IS)	-

Desarrollo de Software (IS)	-
Diseño de Interfaces de Usuario (IS)	-
Sistemas de Información Basados en Web (IS)	HTML, CSS, Javascript, XML, PHP, AJAX, W3C
Sistemas Gráficos (IS)	JavaScript, C++
Administración de Bases de Datos (SI)	Java
Ingeniería de Sistemas de Información (SI)	Middleware
Programación Web (SI)	HTTP, HTML, CSS, PHP, Javascript, Ajax
Sistemas de Información para Empresas (SI)	xml, apache, php, python,
Sistemas Multidimensionales (SI)	-
Computación Ubicua e Inteligencia Ambiental (TI)	-
Servidores Web de Altas Prestaciones (TI)	Apache, HTML, PHP
Sistemas Multimedia (TI)	Java, Framework
Tecnologías Web (TI)	HTTP, HTML, CSS, PHP, Javascript
Transmisión de Datos y Redes de Computadores (TI)	Apache
Arquitectura de Sistemas (IC)	-
Arquitectura y Computación de Altas Prestaciones (IC)	-
Desarrollo de Hardware Digital (IC)	-
Diseño de Sistemas Electrónicos (IC)	-
Sistemas con Microprocesadores (IC)	-
Bases de Datos Distribuidas	SQL, SQLdeveloper
Centro de Procesamiento de Datos	Docker, NextCloud
Desarrollo Basado en Agentes	Mini SCRUM, javaFX jade,
Desarrollo de Aplicaciones Para Internet	SQL, noSQL, CSS, Ajax, Flask
Dirección y Gestión de Proyectos	-


Infraestructura Virtual	DevOps
Inteligencia de Negocio	-
Metodologías de desarrollo Ágil	Scrum
Nuevos paradigmas de Interacción	Android Wear, Google VR
Procesadores de Lenguajes	Lex/Flex, Yacc/Bison
Programación Técnica y científica	Python, OpenCV
Recuperación de Información	Java, Lucene
Seguridad y Protección de Sistemas Informáticos	TLS, HTTP
Simulación de Sistemas	-
Sistemas Empotrados	-
Tecnologías de Red	-
Teoría de la Información y la Codificación	Python
Visión por Computador	Python, C++
Tratamiento de Imágenes Digitales	Python, Numpy

### III. Parte 2: APEX

### 1.1.- Crear una app APEX a partir de una hoja de cálculo

Solicitamos el workspace a Oracle Apex.

[https://apexapps.oracle.com/pls/apex/dbpm/r/livelabs/run-workshop?p210\\_wid=634](https://apexapps.oracle.com/pls/apex/dbpm/r/livelabs/run-workshop?p210_wid=634)



## Desarrollo con poco código

**Duración:** 1 hora

**Público destinatario:** Principiante

**Objetivos:**

- Crear una instancia de Autonomous Transaction Processing
- Acceder a APEX en Oracle Cloud
- Crear un espacio de trabajo de APEX
- Crear una aplicación a partir de un archivo
- Usar SQL rápido para crear objetos de base de datos
- Usar SQL Developer Web para acceder a objetos de base de datos
- Usar SQL Developer Web para crear un modelo de datos
- Crear y modificar una aplicación APEX

Obtenga más información sobre cómo empezar a crear aplicaciones fácilmente con APEX y SQL Developer Web.

## Dashboard principal de APEX

App Builder

SQL Workshop

Team Development

Gallery

MC

Marina Jun Carra...

ddsi\_practicas\_22-23

Oracle APEX 22.2 now available for download.

Manage Service

Manage Users and Groups

Monitor Activity

Dashboards

Utilization Report

Workspace Message

Welcome to "DDSI\_PRACTICAS\_22-23" workplace!

Service	Users		Activity	
Workspace Name	DDSI_PRACTICAS_22-23	Users	2	Reporting Timeframe 3 hours
Applications	1	Workspace Administrators	2	Page Events 33
SQL Scripts	0	Application Developers	2	Median Page Time 0.78
Schemas	1	End Users	0	Distinct Applications 4
Open Requests	0	Created Last 24 Hours	0	Distinct Users 2

About

Workspace Administration enables you to manage your account. Depending on your privileges, you can monitor and administer this workspace.

Learn More ...

Tasks

Change My Password

Manage User Groups

Create User

Create Multiple Users

Delete Multiple Users

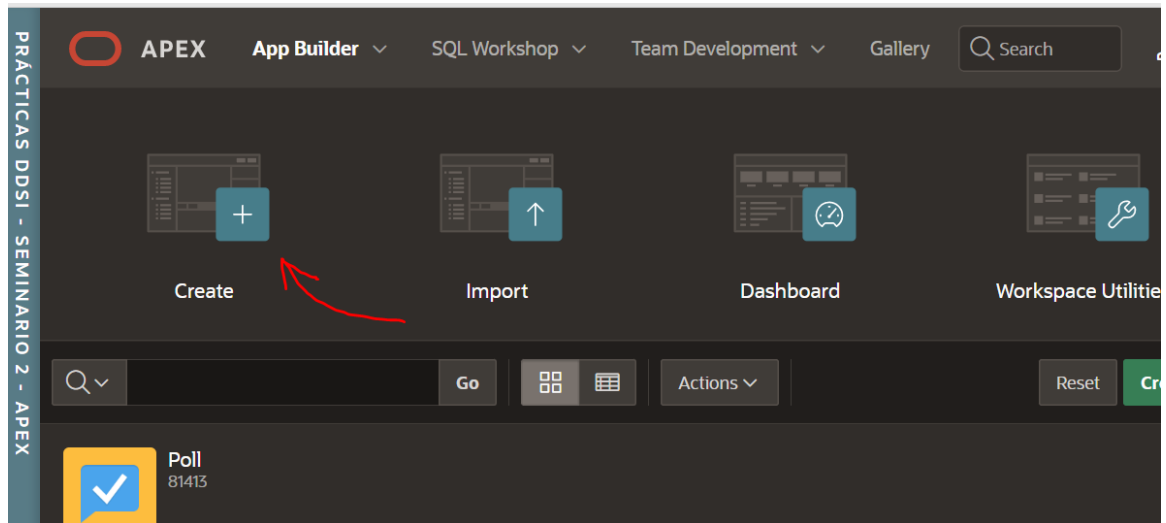
Manage Interactive Report Settings

Manage Export Repository

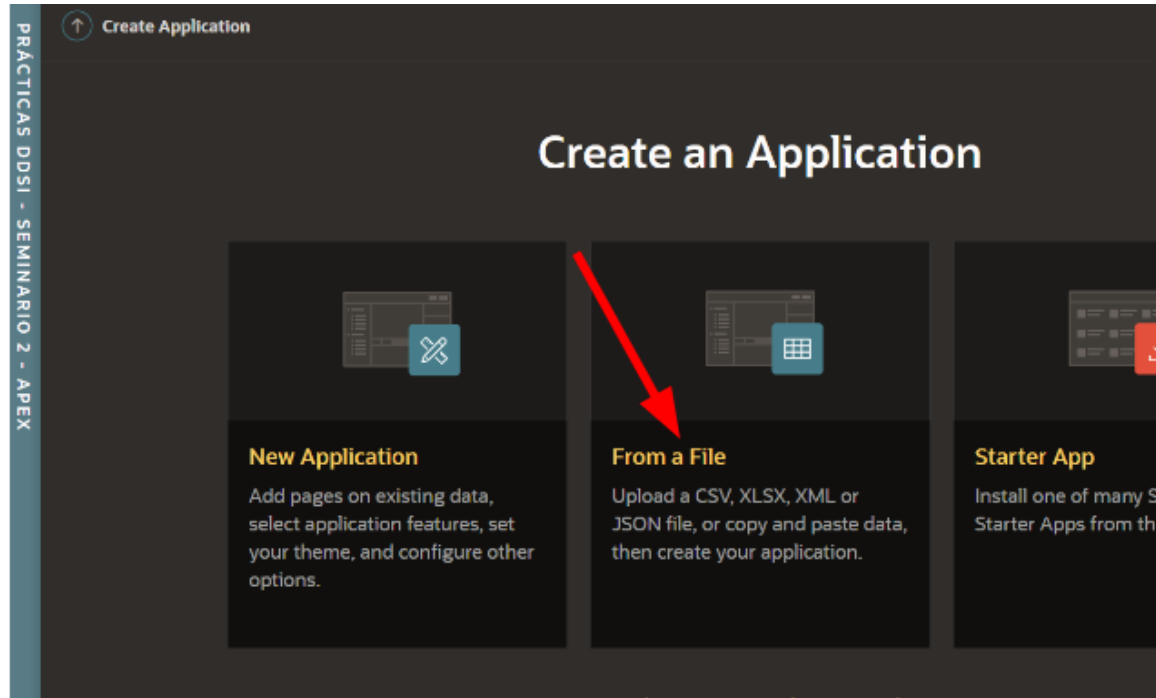
Request a New Workspace

Define Environment Banner

Creamos la aplicación APEX



Usamos un archivo para crearla (from a file)





Cargamos los datos si los hubiera, en nuestro hemos usado las tablas por defecto de Apex que se pueden generar.

PRACTICAS DDSI - SEMINARIO 2 - APEX

Load Data

Upload a File

Copy and Paste

You can copy and paste CSV data, or select a sample data set.

Project and Tasks

Project Task Name	Start Date	End Date	Status	Assigned To	Cost	Budget
ACME Web Configuration	Identify server requirements	01/04/2023	Closed	John Watson	100	200
Maintain Support Systems	HR software upgrades	12/23/2022	On-Hold	Pam King	8000	7000
Maintain Support Systems	Apply Billing System updates	11/03/2022	On-Hold	Russ Sanders	9500	7000
ACME Web Configuration	Determine Web listener configuration(s)	12/13/2022	Closed	James Cassidy	100	100
ACME Web Configuration	Specify security authentication scheme(s)	12/21/2022	Closed	John Watson	200	300
ACME Web Configuration	Select servers for Development, Test, Production	12/21/2022	Closed	James Cassidy	200	300
Email Integration	Complete plan	12/09/2022	Closed	Mark Nile	3000	1500
ACME Web Configuration	Configure Workspace provisioning	12/14/2022	Closed	John Watson	200	100
ACME Web Configuration	Create pilot workspace	12/07/2022	Closed	John Watson	100	100
ACME Web Configuration	Run installation	12/14/2022	Closed	James Cassidy	100	100
Bug Tracker	Implement bug tracking software	01/07/2023	Closed	Myra Sutcliffe	100	100
Bug Tracker	Review automated testing tools	12/18/2022	On-Hold	Myra Sutcliffe	2750	1500
Train Developers	Publish development standards	12/30/2022	On-Hold	John Watson	1000	2000
Train Developers	Publish links to self-study courses	12/28/2022	Closed	John Watson	100	100

Y indicamos dónde cargar esos datos.

Load Data

Where do you want to load this data?

Load To

New Table

Existing Table

Table Owner

WKSP\_DDSIPRACTICAS2223

Table Name

PROJECT\_TASKS

Please select the columns to load.

Configure

Primary Keys

SYS\_GUID

Identity Column

Use Column Data Types

Settings

Column Headers

First line contains headers

Column Delimiter

.

:

|

#

tab

Enclosed By

None

"

'

File Encoding

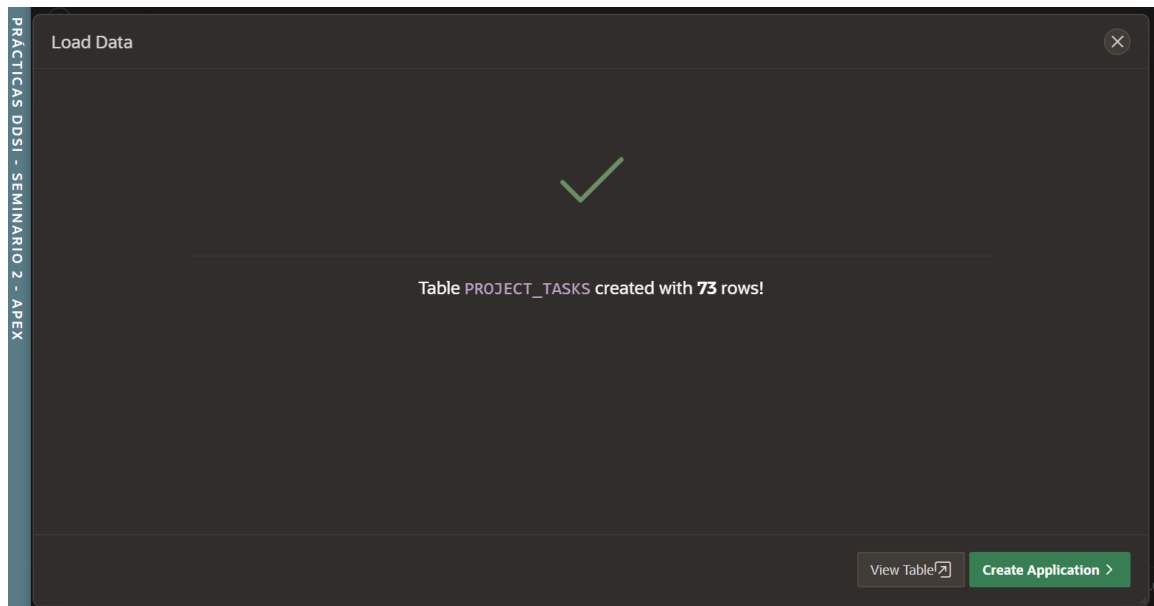
Unicode UTF-8

<

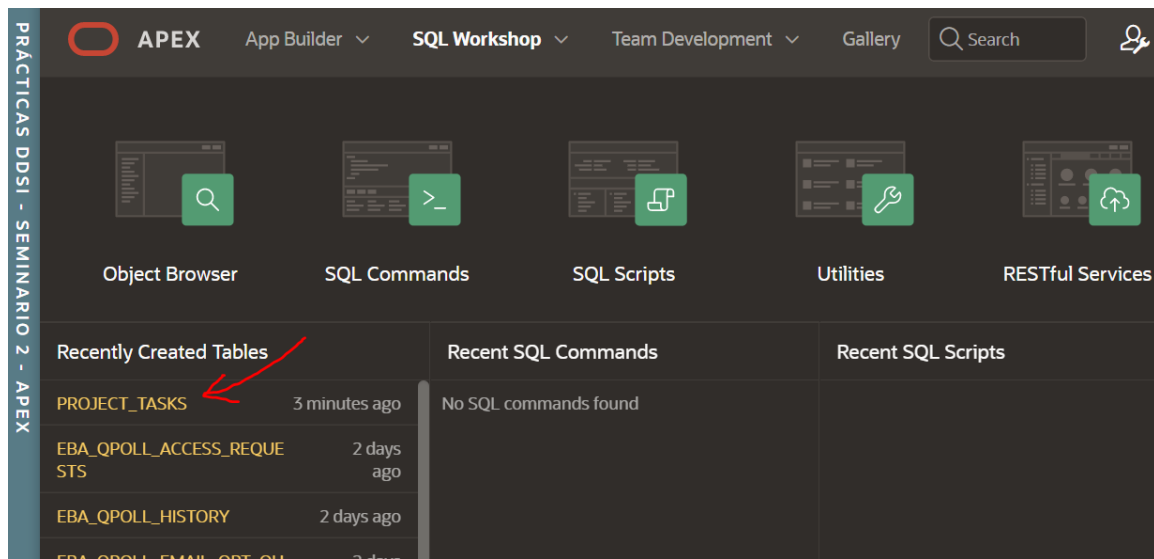
Cancel

Load Data

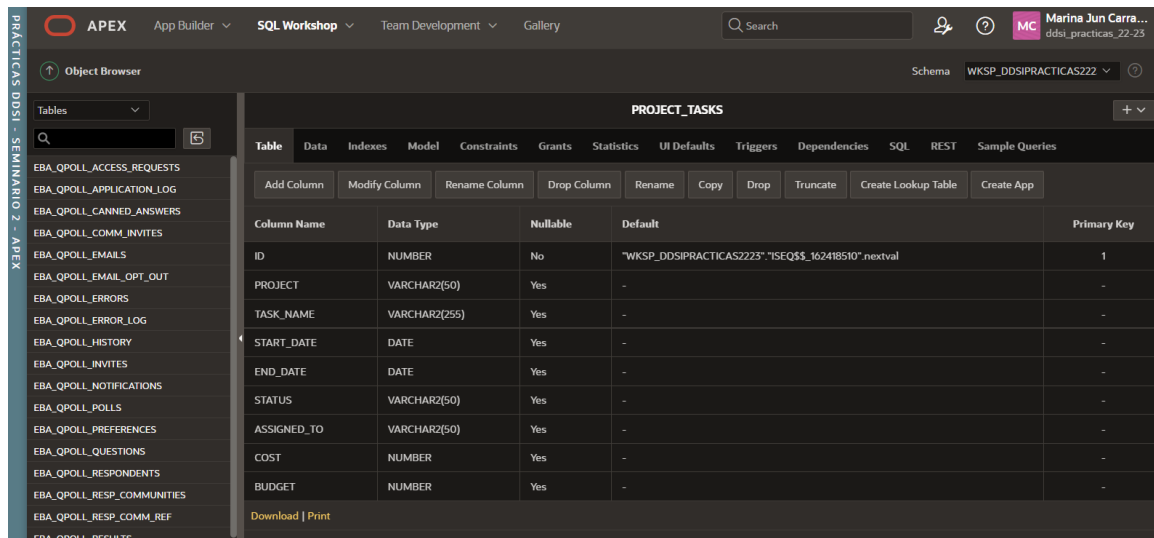
Se crea correctamente.



Vemos a nuestra tabla recién creada:



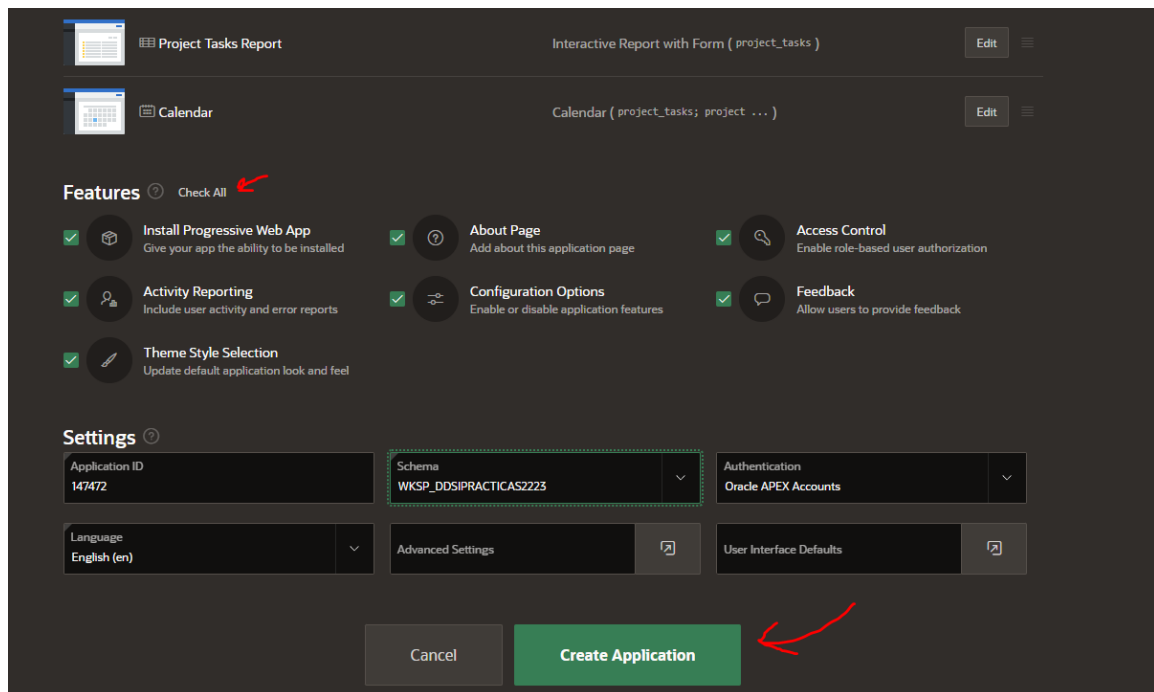
Podemos ver la tabla y sus atributos:



The screenshot shows the APEX Object Browser interface. On the left, a list of tables is visible, including EBA\_QPOLL\_ACCESS\_REQUESTS, EBA\_QPOLL\_APPLICATION\_LOG, EBA\_QPOLL\_CANNED\_ANSWERS, EBA\_QPOLL\_COMM\_INVITES, EBA\_QPOLL\_EMAILS, EBA\_QPOLL\_EMAIL\_OPT\_OUT, EBA\_QPOLL\_ERRORS, EBA\_QPOLL\_ERROR\_LOG, EBA\_QPOLL\_HISTORY, EBA\_QPOLL\_INVITES, EBA\_QPOLL\_NOTIFICATIONS, EBA\_QPOLL\_POLLS, EBA\_QPOLL\_PREFERENCES, EBA\_QPOLL\_QUESTIONS, EBA\_QPOLL\_RESPONDENTS, EBA\_QPOLL\_RESP\_COMMUNITIES, EBA\_QPOLL\_RESP\_COMM\_REF, and EBA\_QPOLL\_RESULTS. The main area displays the structure of the PROJECT\_TASKS table. The table has columns: ID (NUMBER, Not Null, Default: "WKSP\_DDSIPRACTICAS2223"."SEQ\$\$\_162418510".nextval, Primary Key), PROJECT (VARCHAR2(50), Yes), TASK\_NAME (VARCHAR2(255), Yes), START\_DATE (DATE, Yes), END\_DATE (DATE, Yes), STATUS (VARCHAR2(50), Yes), ASSIGNED\_TO (VARCHAR2(50), Yes), COST (NUMBER, Yes), and BUDGET (NUMBER, Yes). The interface includes tabs for Table, Data, Indexes, Model, Constraints, Grants, Statistics, UI Defaults, Triggers, Dependencies, SQL, REST, and Sample Queries. A toolbar at the top of the table view includes buttons for Add Column, Modify Column, Rename Column, Drop Column, Rename, Copy, Drop, Truncate, Create Lookup Table, and Create App. A 'Download | Print' link is at the bottom of the table view.

Column Name	Data Type	Nullable	Default	Primary Key
ID	NUMBER	No	"WKSP_DDSIPRACTICAS2223"."SEQ\$\$_162418510".nextval	1
PROJECT	VARCHAR2(50)	Yes	-	-
TASK_NAME	VARCHAR2(255)	Yes	-	-
START_DATE	DATE	Yes	-	-
END_DATE	DATE	Yes	-	-
STATUS	VARCHAR2(50)	Yes	-	-
ASSIGNED_TO	VARCHAR2(50)	Yes	-	-
COST	NUMBER	Yes	-	-
BUDGET	NUMBER	Yes	-	-

Se crea la aplicación con esos datos anteriormente cargados.



The screenshot shows the APEX application creation wizard. At the top, there are two preview cards: 'Project Tasks Report' (Interactive Report with Form ( project\_tasks )) and 'Calendar' (Calendar ( project\_tasks; project ... )). Below these is the 'Features' section with a 'Check All' link and a red arrow pointing to it. The features listed are: Install Progressive Web App (checked), Activity Reporting (checked), Theme Style Selection (checked), About Page (checked), Configuration Options (checked), Access Control (checked), and Feedback (checked). The 'Settings' section includes: Application ID (147472), Schema (WKSP\_DDSIPRACTICAS2223), Authentication (Oracle APEX Accounts), Language (English (en)), Advanced Settings, and User Interface Defaults. At the bottom, there are 'Cancel' and 'Create Application' buttons, with a red arrow pointing to the 'Create Application' button.

**Project Tasks Report** Interactive Report with Form ( project\_tasks ) **Edit**

**Calendar** Calendar ( project\_tasks; project ... ) **Edit**

**Features** ? Check All

- ☒ **Install Progressive Web App**  
Give your app the ability to be installed
- ☒ **Activity Reporting**  
Include user activity and error reports
- ☒ **Theme Style Selection**  
Update default application look and feel
- ☒ **About Page**  
Add about this application page
- ☒ **Configuration Options**  
Enable or disable application features
- ☒ **Access Control**  
Enable role-based user authorization
- ☒ **Feedback**  
Allow users to provide feedback

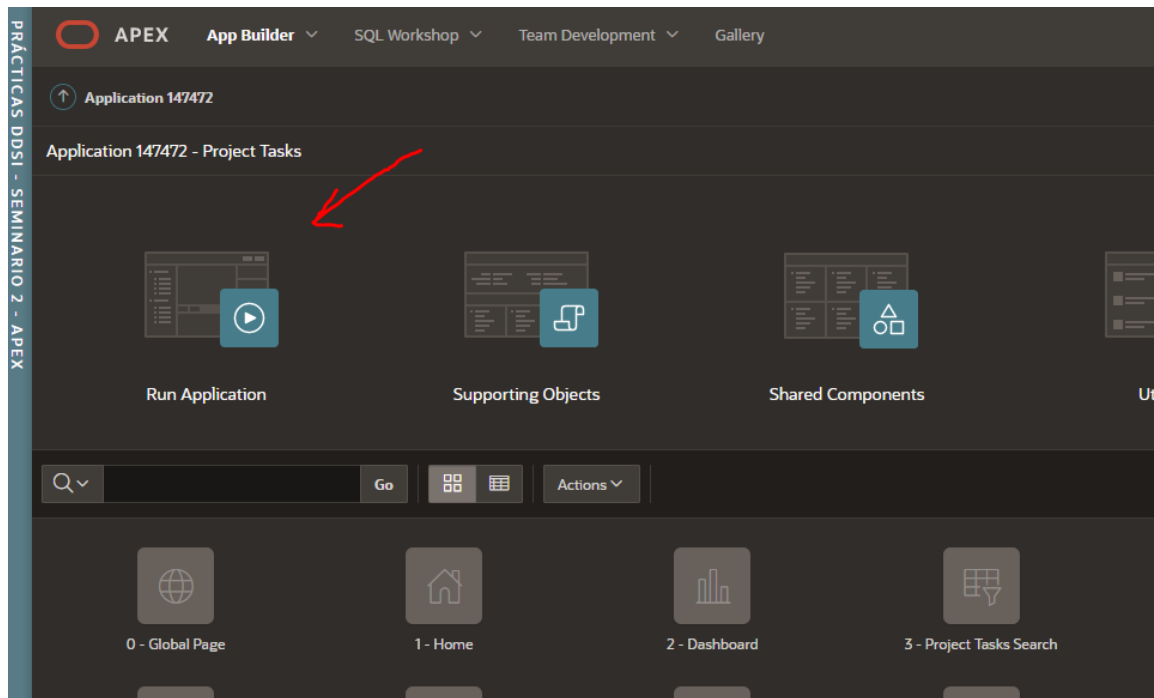
**Settings** ?

Application ID: 147472 Schema: WKSP\_DDSIPRACTICAS2223 Authentication: Oracle APEX Accounts

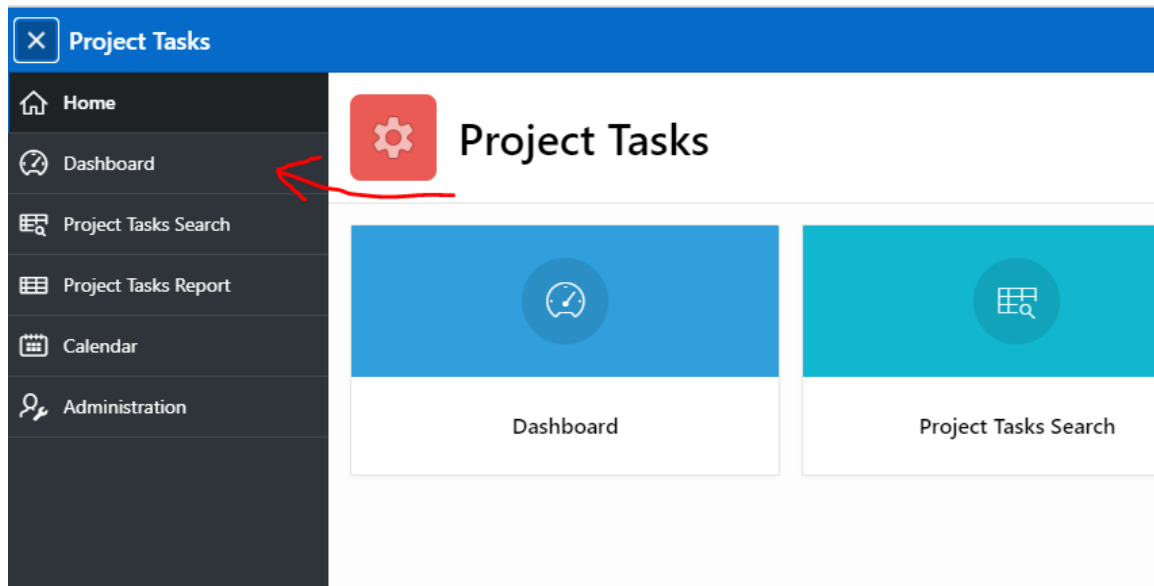
Language: English (en) Advanced Settings User Interface Defaults

**Cancel** **Create Application**

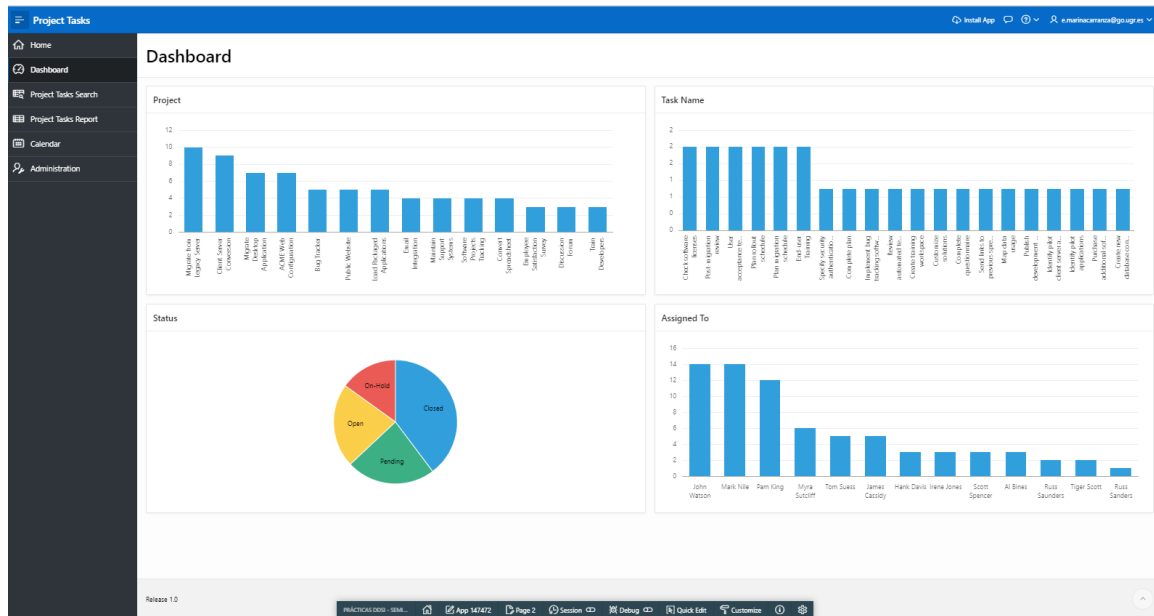
Ejecutamos la aplicación:



Navegamos a la dashboard de la aplicación recién creada

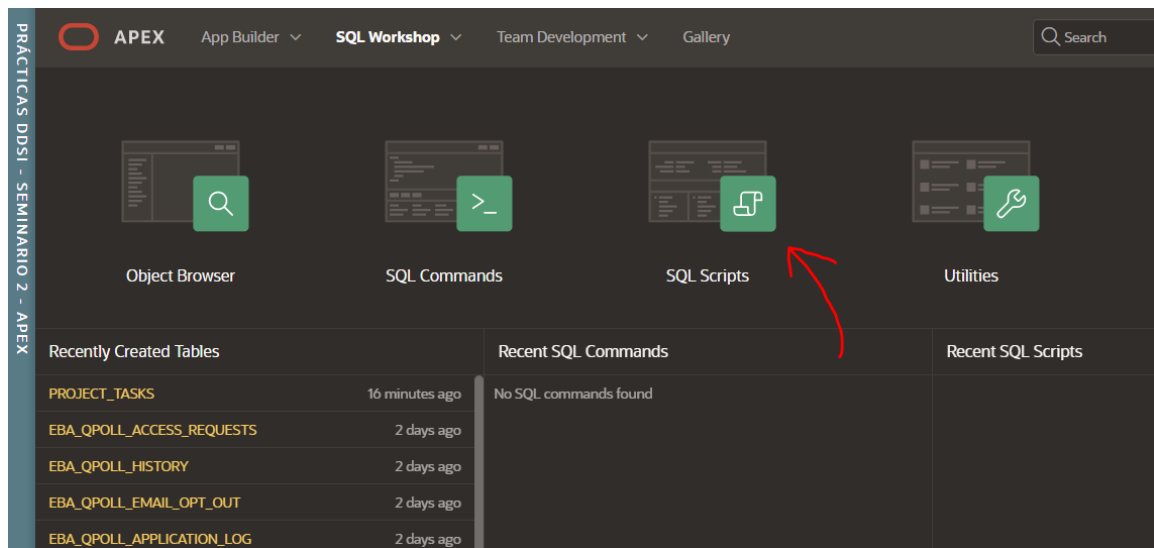


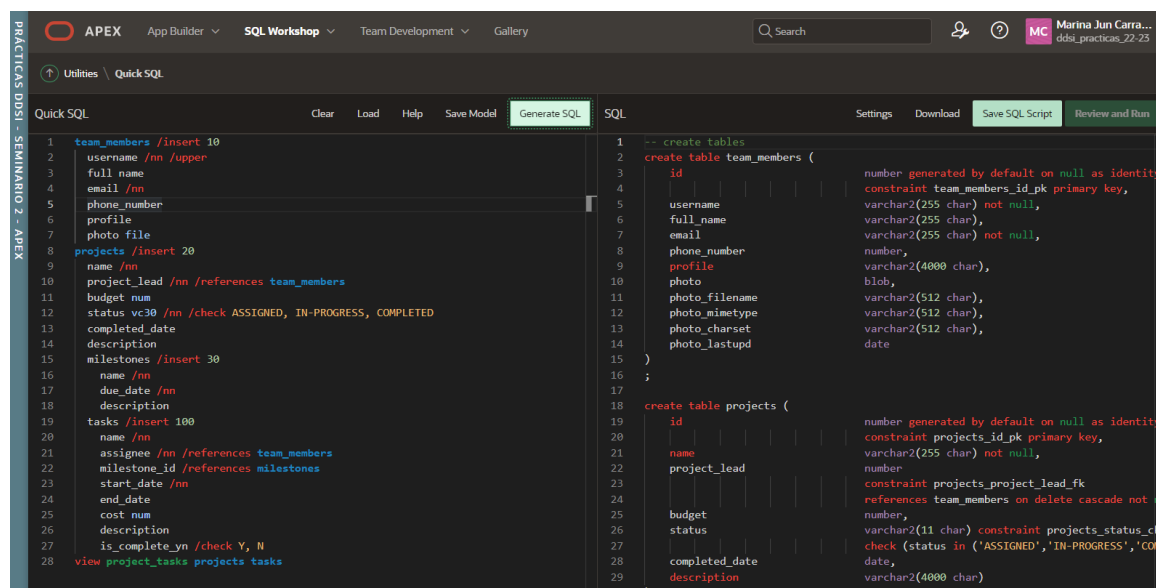
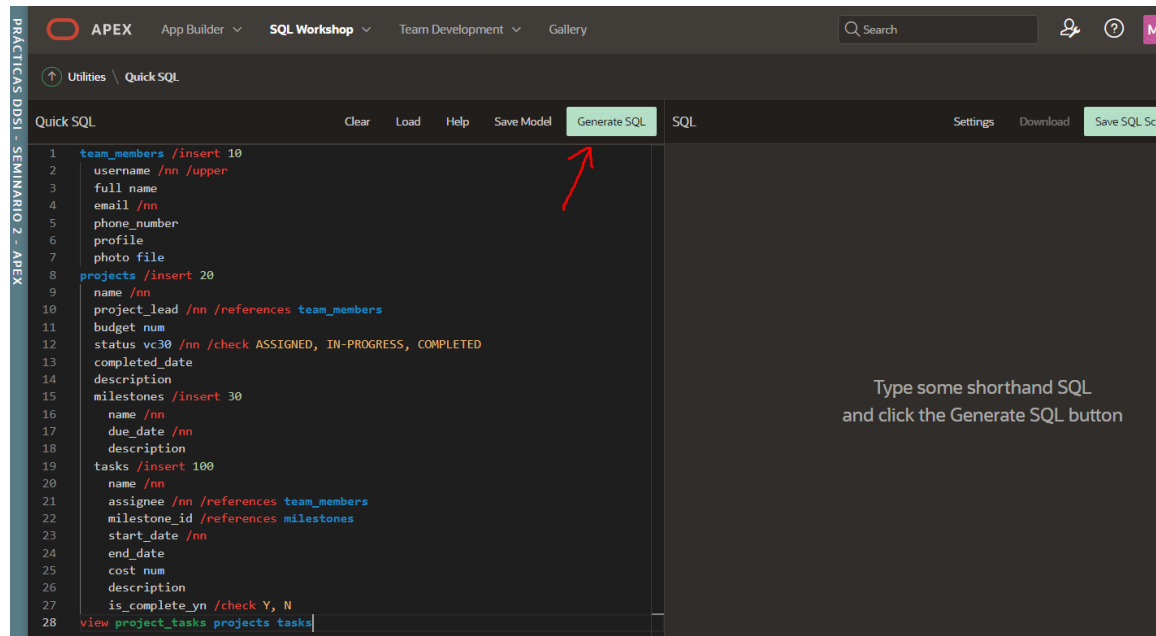
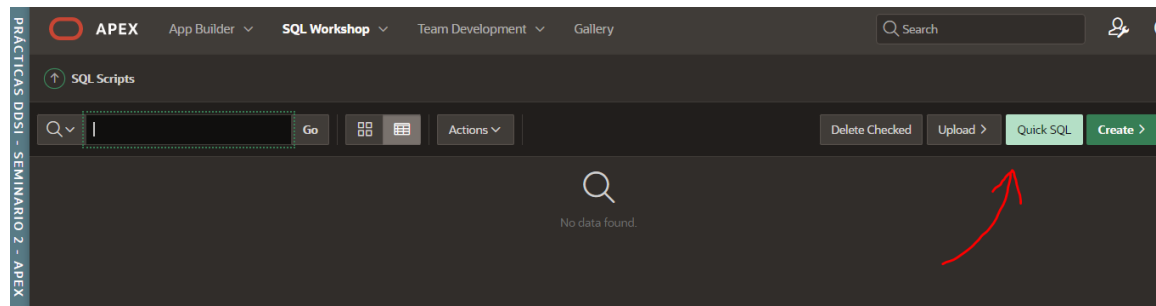
Mostramos las estadísticas de los datos de la aplicación:



## 1.2.- Construir objetos BD en Autonomous Database

Adicionalmente, hemos probado con Apex a construir un objeto BD. Análogamente a crear una tabla con un archivo, podemos utilizar un pseudolenguaje de SQL para crear la aplicación llamada Quick SQL. Luego apex convierte este pseudolenguaje en SQL y lo ejecuta.





Clear Load Help Save Model **Generate SQL** SOI Settings Download

## Settings

Table

Object Prefix  ?

Schema  ?

On Delete ☐ Cascade ☒ Restrict ☐ Set Null ?

Compression ☐ ?

Generate Inserts ☒ ?

Primary Key

Add Primary Key ☒ ?

Population Method  ?

Cancel Reset **Save Changes**

Clear Load Help Save Model **Generate SQL** SOI Settings Download

## Settings

Column

Date Data Type  ?

Semantics  ?

Additional Columns

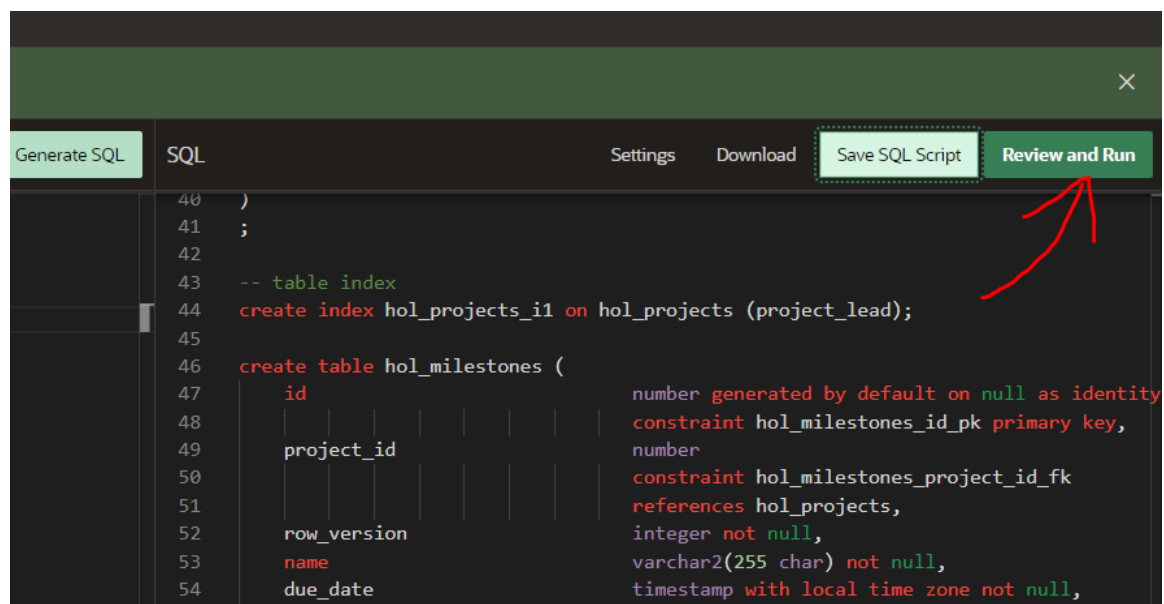
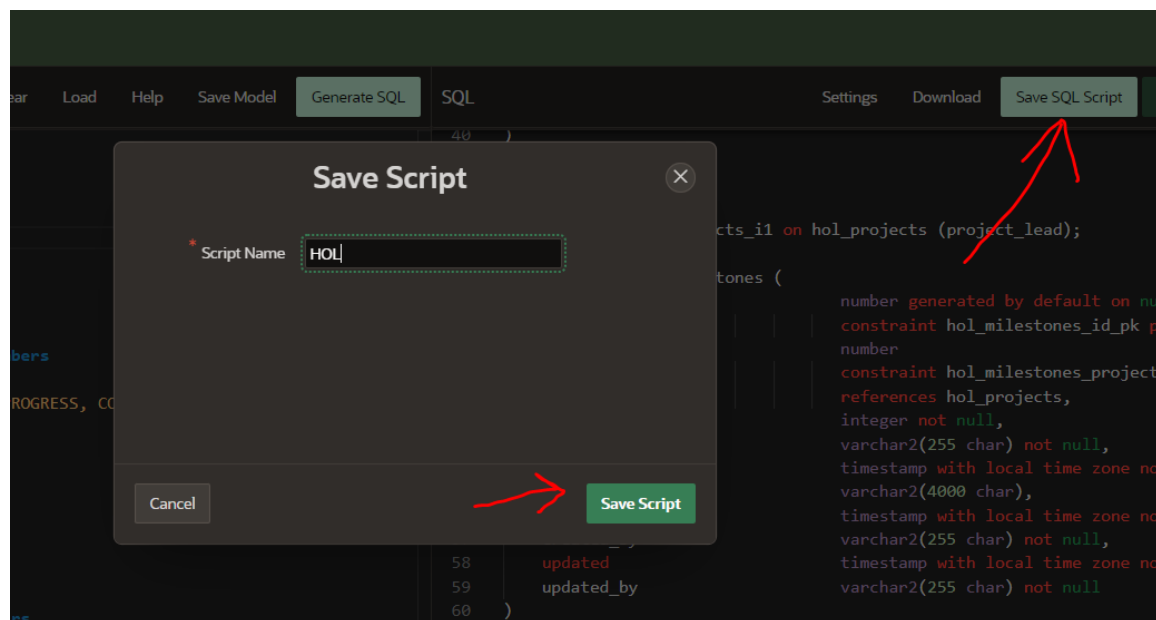
Include ☒ Audit Columns ☒ Row Version Number ☐ Row Key ☐ Tenant ID

Options

Data Language  ?

PI /SQL API ☐ ?

Cancel Reset **Save Changes**





APEX App Builder SQL Workshop Team Development Gallery

SQL Scripts \ Script Editor

Script Name: HOL

Cancel Download Delete Save Create App Run

```
1 -- create tables
2 create table hol_team_members (
3     id number generated by default on null as identity
4     constraint hol_team_members_id_pk primary key,
5     row_version integer not null,
6     username varchar2(255 char) not null,
7     full_name varchar2(255 char),
8     email varchar2(255 char) not null,
9     phone_number number,
10    profile varchar2(4000 char),
11    photo blob,
12    photo_filename varchar2(512 char),
13    photo_mimetype varchar2(512 char),
14    photo_charset varchar2(512 char),
15    photo_lastupd timestamp with local time zone,
16    created timestamp with local time zone not null,
17    created_by varchar2(255 char) not null,
18    updated timestamp with local time zone not null,
19    updated_by varchar2(255 char) not null
20 )
21 ;
22
23 create table hol_projects (
24     id number generated by default on null as identity
25     constraint hol_projects_id_pk primary key,
```

## Run Script

You have requested to run the following script. Please confirm your request.

Script Name	HOL
Created	on 12/16/2022 03:55:23 PM by E.MARINACARRANZA@GO.UGR.ES
Updated	on 12/16/2022 03:56:36 PM by E.MARINACARRANZA@GO.UGR.ES
Number of Statements	182
Script Size in Bytes	136,304

Cancel Run Now

**APEX** App Builder SQL Workshop Team Development Gallery

Script: **HOL** Status: **Complete**

View: **Detail** Summary Rows: **15**

Number	Elapsed	Statement	Feedback	Rows
1	0.10	create table hol_team_members ( id	Table created.	0
2	0.06	create table hol_projects ( id	Table created.	0
3	0.02	create index hol_projects_i1 on hol_projects (project_head)	Index created.	0
4	0.07	create table hol_milestones ( id	Table created.	0
5	0.03	create index hol_milestones_i1 on hol_milestones (project_id	Index created.	0
6	0.08	create table hol_tasks ( id	Table created.	0
7	0.02	create index hol_tasks_i142 on hol_tasks (assignee)	Index created.	0
8	0.01	create index hol_tasks_i142 on hol_tasks (milestone_id)	Index created.	0
9	0.02	create index hol_tasks_i153 on hol_tasks (project_id)	Index created.	0
10	0.06	create or replace trigger hol_team_members_btu before in	Trigger created.	0
11	0.06	create or replace trigger hol_projects_btu before insert	Trigger created.	0
12	0.06	create or replace trigger hol_milestones_btu before ino	Trigger created.	0
13	0.08	create or replace trigger hol_tasks_btu before insert or	Trigger created.	0
14	0.03	create or replace view hol_project_tasks as select pro	View created.	0
15	0.05	insert into hol_team_members ( id, username, ful	1 row(s) inserted.	1


Download

row(s) 1 - 15 of 152 **Next**


182 Statements Processed 182 Successful 0 With Errors

**APEX** App Builder SQL Workshop Team Development Gallery


Search



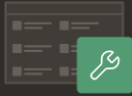
Object Browser



SQL Commands



SQL Scripts



Utilities

Recently Created Tables

HOL_MILESTONES	96 seconds ago
HOL_TEAM_MEMBERS	96 seconds ago
HOL_TASKS	96 seconds ago
HOL_PROJECTS	96 seconds ago
PROJECT_TASKS	25 minutes ago

Recent SQL Commands

No SQL commands found

Recent SQL Scripts

HOL

**APEX** App Builder SQL Workshop Team Development Gallery

Object Browser

Schema: WKSP\_DDSIPRACTICAS222

**HOL\_PROJECTS**

Table	Data	Indexes	Model	Constraints	Grants	Statistics	UI Defaults	Triggers	Dependencies	SQL	REST	Sample Queries
Add Column	Modify Column	Rename Column	Drop Column	Rename	Copy	Drop	Truncate	Create Lookup Table	Create App			
Column Name	Data Type	Nullable	Default	Primary								
ID	NUMBER	No	"WKSP_DDSIPRACTICAS222"."ISEQ\$\$_162421583".nextval									
ROW_VERSION	NUMBER	No	-									
NAME	VARCHAR2(255)	No	-									
PROJECT_LEAD	NUMBER	No	-									
BUDGET	NUMBER	Yes	-									
STATUS	VARCHAR2(11)	No	-									
COMPLETED_DATE	TIMESTAMP(6) WITH LOCAL TIME ZONE	Yes	-									
DESCRIPTION	VARCHAR2(4000)	Yes	-									
CREATED	TIMESTAMP(6) WITH LOCAL TIME ZONE	No	-									
CREATED_BY	VARCHAR2(255)	No	-									
UPDATED	TIMESTAMP(6) WITH LOCAL TIME ZONE	No	-									
UPDATED_BY	VARCHAR2(255)	No	-									

Download | Print

**APEX** App Builder SQL Workshop Team Development Gallery

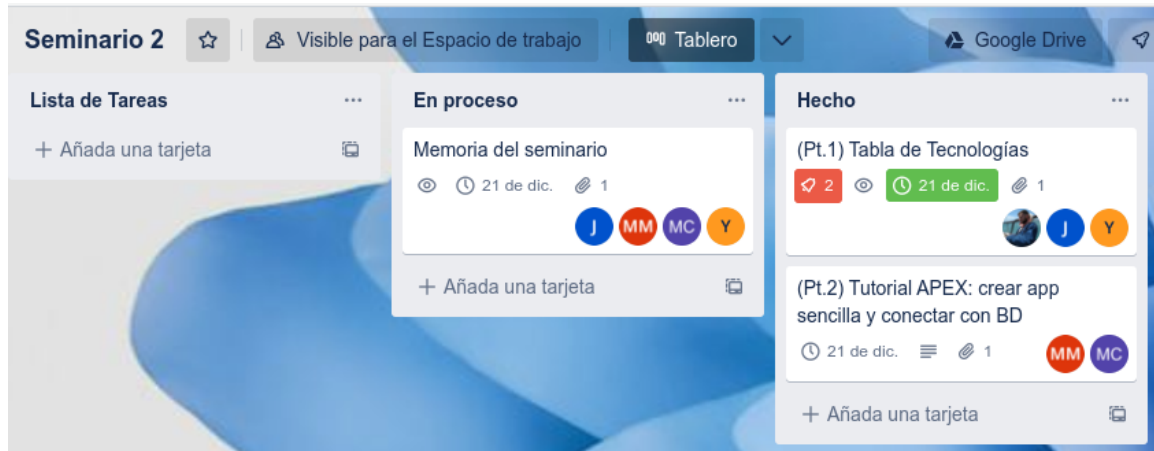
Object Browser

Schema: WKSP\_DDSIPRACTICAS222

**HOL\_PROJECTS**

Table	Data	Indexes	Model	Constraints	Grants	Statistics	UI Defaults	Triggers	Dependencies	SQL	REST	Sample Queries
Query	Count Rows	Insert Row	Load Data									
EDIT	ID	ROW_VERSION	NAME	PROJECT_LEAD	BUDGET	STATUS	COMPLETED_DATE	DESCRIPTION	CREATED	CREATED_BY	UPDATED	UPDATED_BY
	1	1	Redford Office Upgrade	4	18	ASSIGNED	16-JAN-22 03:56:56.000000 PM	In facibus orn et ultrices posuere cubilia Curae. Proin vulputate placerat pellentesque. Proin viverra tincidunt, quis consectetur mi venenatis nec. Donec convallis sollicitudin elementum. Nulla facilis. In posuere blandit litora molestias. Vivamus efficitur ipsum tellus, quis posuere.	16-DEC-22 03:56:56.777960 PM	EMARINACARRANZA@GOLUGLES	16-DEC-22 03:56:56.777960 PM	EMARINACARRANZA@GOLUGLES
	2	1	User App	9	71	IN-PROGRESS	16-SEP-22 03:56:56.000000 PM	Venenatis nec. Donec convallis sollicitudin elementum. Nulla facilis.	16-DEC-22 03:56:56.805218 PM	EMARINACARRANZA@GOLUGLES	16-DEC-22 03:56:56.805230 PM	EMARINACARRANZA@GOLUGLES
	3	1	Support Training Initiative	2	99	COMPLETED	16-SEP-22 03:56:56.000000 PM	Si amet lectus. Nulla placerat tincidunt aliquam. Vestibulum tincidunt arcu in risus pharetra. Aliquam risus rhoncus. Curabitur vulputate purus tellus. Nam tempus diam suscipit elementum sed. Proin sit amet massa eu lorem commodo ullamcorper interdum et molestias tames ac ante ipsum primis in faucibus. Ut et nulla ac sapien suscipit tristique ac volutpat risus. Praesent litora ligula commodo.	16-DEC-22 03:56:56.810421 PM	EMARINACARRANZA@GOLUGLES	16-DEC-22 03:56:56.810432 PM	EMARINACARRANZA@GOLUGLES
	4	1	Visual API	3	27	ASSIGNED	16-MAY-21 03:56:56.000000 PM	Viverra tincidunt, quis consectetur mi venenatis nec. Donec convallis sollicitudin elementum. Nulla facilis. In posuere blandit litora molestias. Vivamus efficitur ipsum tellus, quis posuere mi maximus vitae. Quisque tortor.	16-DEC-22 03:56:56.815341 PM	EMARINACARRANZA@GOLUGLES	16-DEC-22 03:56:56.815350 PM	EMARINACARRANZA@GOLUGLES
	5	1	Bluefit Upgrade	8	44	IN-PROGRESS	16-APR-22 03:56:56.000000 PM	Ultrices posuere cubilia Curae. Proin vulputate placerat pellentesque. Proin viverra tincidunt, quis consectetur mi venenatis nec. Donec convallis sollicitudin.	16-DEC-22 03:56:56.819969 PM	EMARINACARRANZA@GOLUGLES	16-DEC-22 03:56:56.819979 PM	EMARINACARRANZA@GOLUGLES
	6	1	Proactive Instrumentation	5	100	COMPLETED	16-MAY-21 03:56:56.000000 PM	Ac sapien suscipit tristique ac volutpat risus. Praesent vitae ligula commodo, dictum lorem sit.	16-DEC-22 03:56:56.824480 PM	EMARINACARRANZA@GOLUGLES	16-DEC-22 03:56:56.824489 PM	EMARINACARRANZA@GOLUGLES
								Puribus Sed. Nam semper diam suscipit elementum solibus. Proin sit				

# Anexo - Gestión del seminario 2 (Trello)



Captura 3: Tablero principal de tareas en Trello, para la práctica 2.