

ORACLE

Build Apps through natural language with AI and APEX GenDev

Autonomous Database Learning Lounge

Hosted by Marcos Arancibia

Autonomous Database Product Management

***AUTONOMOUS
DATABASE***

***LEARNING
LOUNGE***

Agenda



Jayson
Hanes

Using Oracle **APEX**, the world's most popular enterprise low-code application platform, developers can **quickly develop and deploy compelling apps** that solve real problems and **provide immediate value**.

Topics

- Introduction to Oracle **APEX on Autonomous Database**.
- Learn how to use the **APEX AI Assistant** to create and fine-tune **custom SQL data models** and associated **sample data** via a natural language interface.
- Easily add **AI Vector Search semantic search functionality** to applications using the standard search component.
- New support for **business process automation** using APEX Visual Workflows.
- New “Create Fusion Integration” option to simplify the process of creating Oracle Fusion Apps extensions.

Q&A

- **Product Managers** will answer any questions

Before we begin...

This session is for you !!!

Ask your questions using Q&A

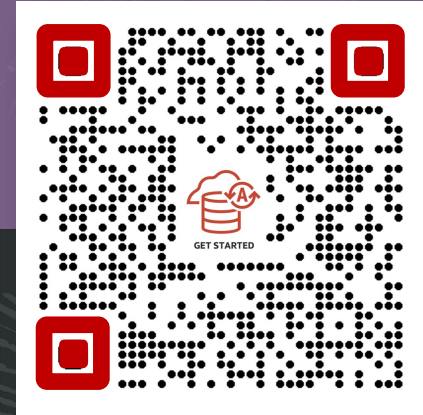
Product Managers are monitoring your questions

We will share links in Chat

**The recording will be made available in a few days at
oracle.com/goto/adb-learning-lounge**

Important links to bookmark

Links to get you started
and to keep up to date with
Autonomous Database



1 Get Started with ADB:
oracle.com/autonomous-database/get-started/

2 Join us:  bit.ly/adb-linkedln-grp  [@AutonomousDW](https://twitter.com/AutonomousDW)
 [Bluesky
autonomousedb.bsky.social](https://autonomousedb.bsky.social)

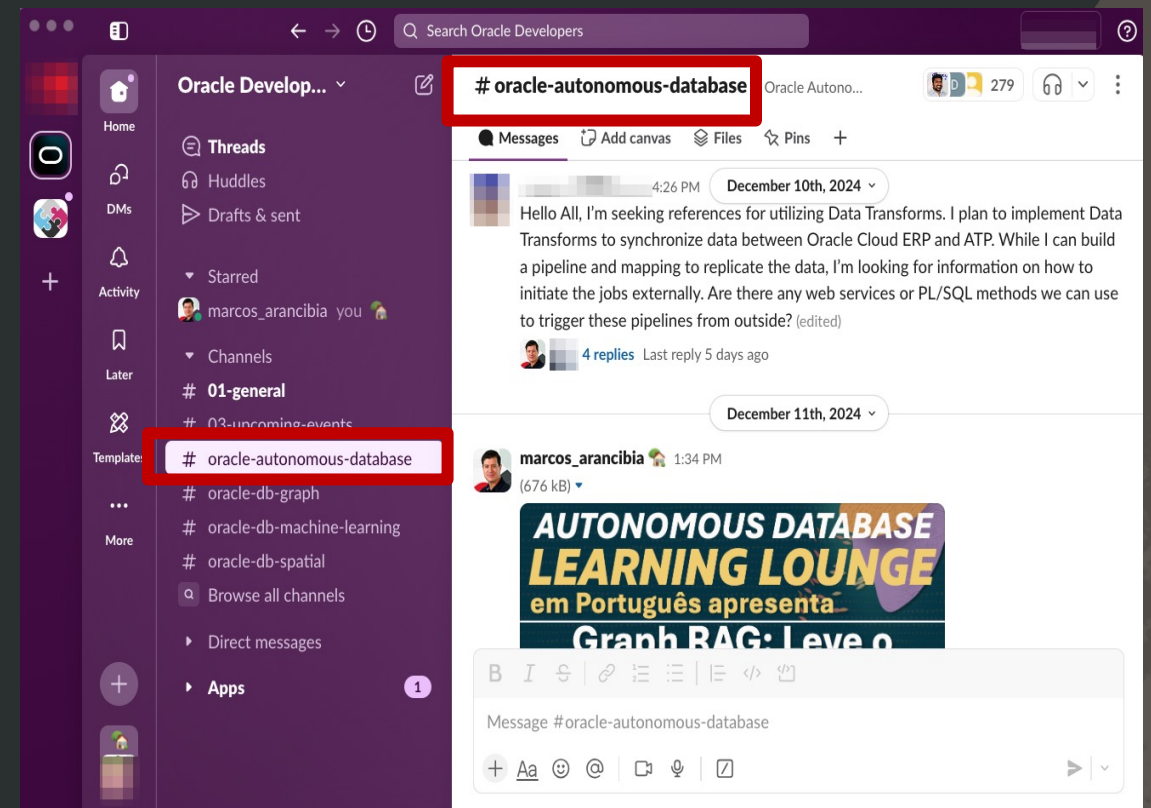
3 Got a question?
We are on stackoverflow
bit.ly/adb-stackoverflow

Join us on Developers Slack
(search #oracle-autonomous-database)
bit.ly/odevrel_slack

Join our External Slack

STEP 1: Join our Slack workspace at:
bit.ly/odevrel_slack

STEP 2: **search for #oracle-autonomous-database**
at the top and click on the Channel



Speaker



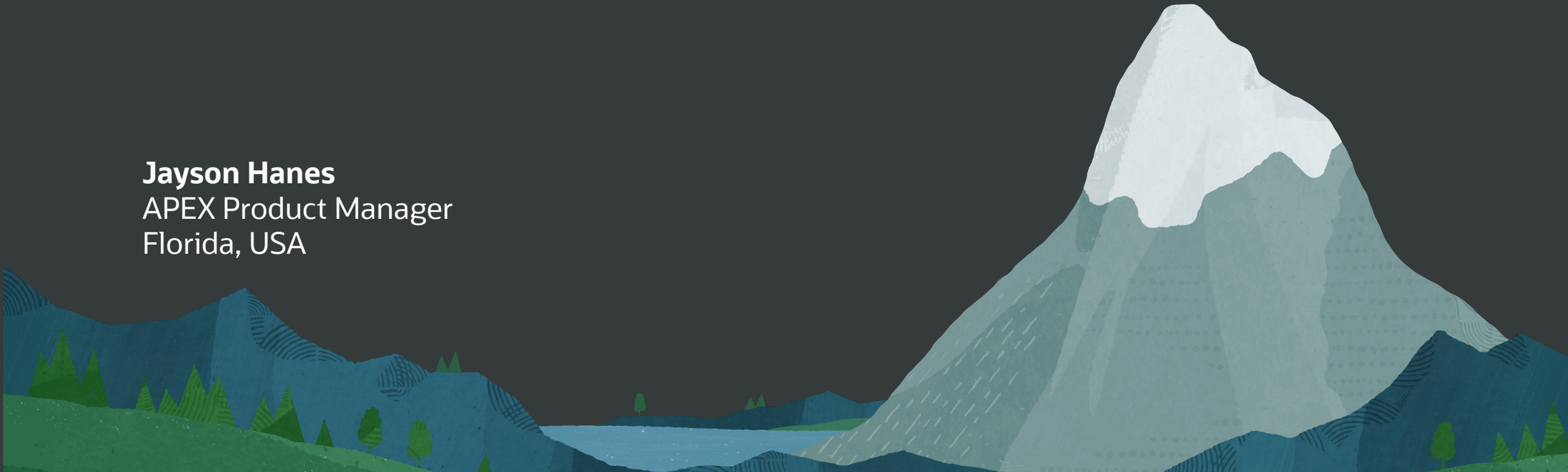
Jayson Hanes



Oracle APEX Generative Development

Everywhere Oracle Database is, especially on Autonomous Database!

Jayson Hanes
APEX Product Manager
Florida, USA

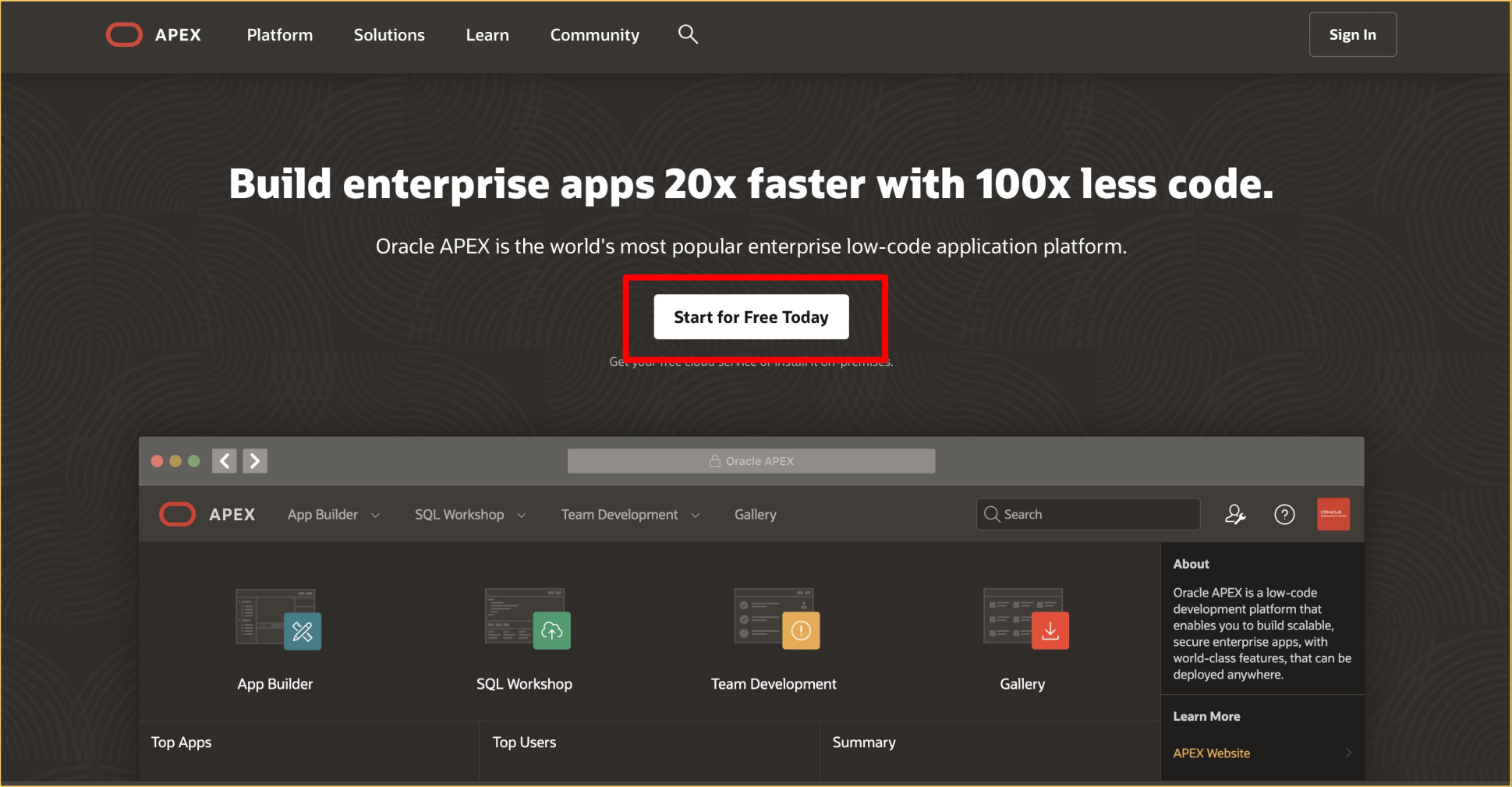


Agenda

- Getting Started with APEX
- New in APEX 24.1 and 24.2:
AI Services & Configurations
- AI Assistant & AI Text Dynamic Actions
- RAG Sources
- AI GenDev Assistant for Developers
- Create a Data Model using AI
- Create an Application using AI
- Advanced RAG Sources Using Vectors
- OCI Generative AI Agents
- Create Fusion Integration

Everything about Oracle APEX

APEX.oracle.com



Oracle APEX is Available Everywhere Oracle Database is!

Oracle Cloud

- APEX Service
- All Database Cloud Services including Autonomous Database
- Oracle Base Database Service
- Oracle Exadata Cloud Service
- **Always Free** APEX Service
- **Always Free** Autonomous Database

On-Premises

- All Oracle Database editions
- Oracle Exadata
- Oracle Database Free

Other Clouds

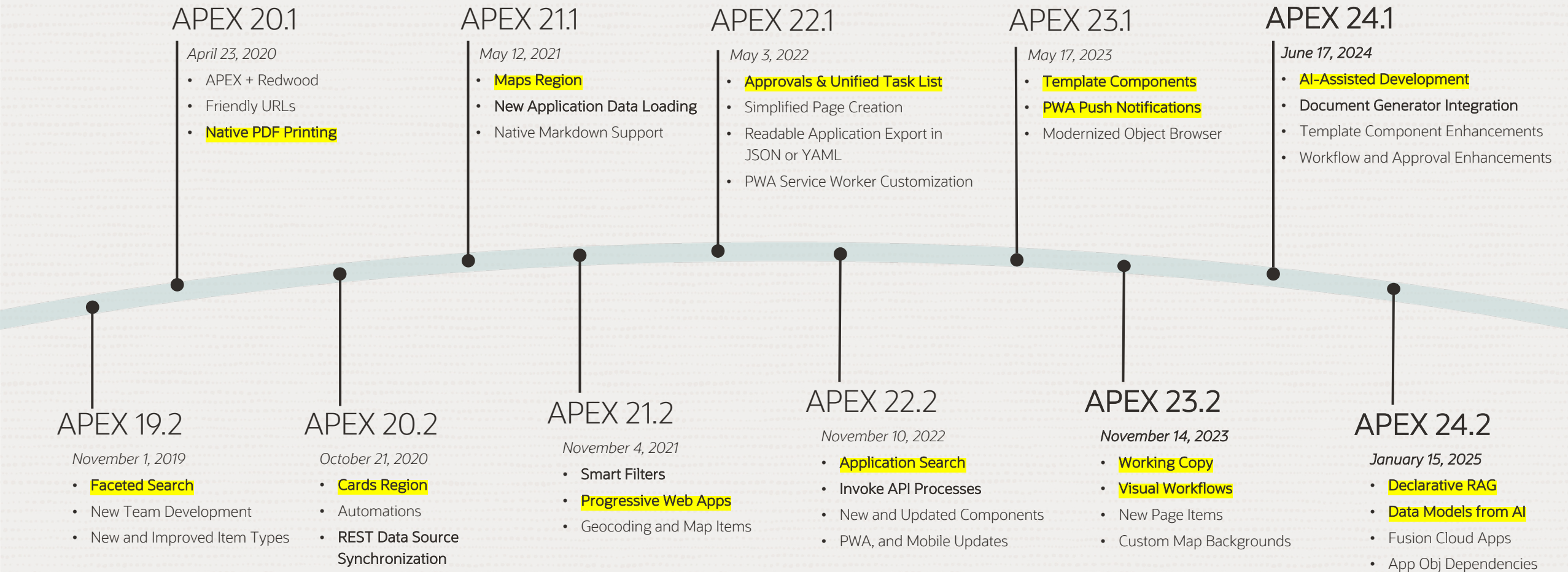
- Autonomous Database on **Azure**
- **Amazon** RDS for Oracle Database
- All other major clouds via **VM**

Oracle APEX is a **fully supported no-cost feature** of
Oracle Autonomous Database
and all Oracle Database Distributions and Editions



Tour a simple APEX application

Oracle APEX powered by No Code / Low Code World Class Features



High Code vs Oracle APEX Low Code



Source: Neel Shah, Visa, posted on LinkedIn

Oracle APEX 24.1, 24.2 Generative Development

APEX AI Assistant



- Create App using GenAI
- APEX AI Assistant (NL2SQL)
- Show AI Assistant
- Generate Text from AI
- Data model from AI

Next-Gen Data Platform with Database 23ai



- AI Vector Search
- Native Server-Side JavaScript
- JSON Relational Duality

AI in APEX requires YOUR AI Service to be configured in each workspace



AI Services

AI Services encapsulate AI Providers, models and credentials.

Supported Providers:

- OpenAI
- Cohere
- OCI Gen AI

Generative AI Service open-ai

CancelDeleteApply Changes

Show AllIdentificationSettingsAdvanced

Identification

* AI ProviderOpen AI?

* Nameopen-ai?

Static IDopen_ai?

Settings

Used by App Builder?

* Base URLhttps://api.openai.com/v1?

Credentials

Test Connection

* Credentialcredentials_for_open_ai?

Advanced

Additional Attributes

AI Modelgpt-4o?

HTTP Headers?

Generative AI Service

The Name and Static ID must be **unique** within the workspace. The developer can select from a list of supported AI Services and specify if the AI Service should be used by App Builder. Only **one** AI Service can be configured for App Builder. Advanced properties including additional HTTP headers and JSON attributes can be configured.

AI Components

- Open AI Assistant Dynamic Action
- APEX_AI APIs

Action

Q

Filter

↳

▼

Identification

Name

Action

Open AI Assistant

▼

☰

▼

Generative AI

Service

open-ai

▼

System Prompt

You are a helpful assistant.

⌵

Welcome Message

How may I help you?

↗

▼

Appearance

Display As

Dialog

▼

AI Configurations

AI Configurations centralize key Generative AI settings.

Customizable **System Prompt**, **Welcome Message**, and **RAG Sources**.

Use it in both the **Show AI Assistant** and **Generate Text with AI** Dynamic Actions

APEX_AI PL/SQL API

Generative AI Configuration

CancelDeleteApply Changes

Show AllIdentificationSubscriptionGenerative AIRAG SourcesAdvancedComments

Generative AI

ServiceOCI Gen AI?

System Prompt?

↶↷🔍👤APEX Assistant⚙️

1 Use the Information provided about the school to answer all questions:

2

3 If the question cannot be answered based on the information provided, say "Sorry, I can't provide an answer to that question based o

Welcome Message?

↶↷🔍👤APEX Assistant⚙️

1 Welcome! What would you like to know about this high school?

RAG SourcesCreate RAG Source

Name	Description	Type	Conditional	Updated	Updated By
School Info	Information about the school	SQL Query		6 days ago	MONICA
course		SQL Query	Yes	6 days ago	MONICA
facilities		SQL Query	Yes	6 days ago	MONICA
language		SQL Query	Yes	6 days ago	MONICA

Review what this looks like in APEX

Review the AI Dynamic Actions

RAG Sources

APEX
24.2

The screenshot shows the 'RAG Source' configuration page in APEX 24.2. The page has a dark theme and includes tabs for 'Show All', 'Identification', 'Description', 'Source', 'Advanced', 'Server-Side Condition', 'Security', 'Configuration', and 'Comments'. The 'Identification' tab is active, showing a 'Name' field with the value 'Project Details RAG Source'. The 'Description' tab is also visible, showing a 'Description' field. The 'Source' tab is active, showing a 'Type' dropdown set to 'SQL Query'. Below this, there is a text area for the SQL query, which contains a SELECT statement with various columns and values. The 'Advanced' tab is also visible, showing a 'Maximum Tokens' field.

RAG Source [Cancel] [Delete] [Apply Changes]

Show All Identification Description Source Advanced Server-Side Condition Security Configuration Comments

Identification

Name Project Details RAG Source

Description

Description

Source

Type SQL Query

SQL Query

```
1 SELECT
2   'Project Name : '
3   || PROJECT_NAME
4   || CHR(10)
5   || CHR(13)
6   || 'Milestone Title : '
7   || MILESTONE_TITLE
8   || CHR(10)
9   || CHR(13)
10  || 'Task Name : '
11  || TASK_NAME
12  || CHR(10)
13  || CHR(13)
14  || 'Task Status : '
15  || TASK_STATUS
```

Advanced

Maximum Tokens

- Use **RAG Sources** to enrich AI conversations with application-specific data.
- Can include **SQL Queries, Function Bodies Returning CLOB, or Static Text.**

apex.oracle.com/go/blog-ai-config-and-rag-sources



RAG Sources – Server-Side Conditions

RAG Source [Cancel] [Delete] [Apply Changes]

Identification

Name: Project Details RAG Source

Description

Description:

Source

Type: SQL Query

SQL Query

```
1 SELECT
2   'Project Name : '
3   || PROJECT_NAME
4   || CHR(10)
5   || CHR(13)
6   || 'Milestone Title : '
7   || MILESTONE_TITLE
8   || CHR(10)
9   || CHR(13)
10  || 'Task Name : '
11  || TASK_NAME
12  || CHR(10)
13  || CHR(13)
14  || 'Task Status : '
15  || TASK_STATUS
```

Advanced

Maximum Tokens:

- Use **Authorization Schemes** or **Server-side Conditions** to control which RAG data is included
- Use **Server-side Condition** offers even more flexibility: **Any User Prompt Contains** and **Last User Prompt Contains**.
- Use **APEX\$AI_ALL_USER_PROMPTS** and **APEX\$AI_LAST_USER_PROMPT** bind variables for custom RAG logic

apex.oracle.com/go/blog-ai-config-and-rag-sources

APEX Generative Development features



Create a Data Model

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes the APEX logo, 'App Builder', 'SQL Workshop' (highlighted with a red circle), 'Team Development', and 'Gallery'. A search bar and user profile 'JA jayson' are also present. Below the navigation bar, there are five main tool categories: Object Browser, SQL Commands, SQL Scripts, Utilities, and RESTful Services. The main content area is divided into three sections: 'Recently Created Tables' (listing tables like OCI_DOCUMENT_UNDERSTANDING_DOCUMENT_CLASSIFICATION), 'Recent SQL Commands' (showing 'No SQL commands found'), and 'Recent SQL Scripts'. On the right sidebar, there is an 'About' section, a 'Schema' section with a dropdown menu set to 'WKSP_DEPHFBSBPTG', and a 'Tasks' section. The 'Create Data Model Using AI' link in the 'Tasks' section is highlighted with a red circle, and a red arrow points from the 'SQL Workshop' navigation item to this link.

Recently Created Tables	Recent SQL Commands	Recent SQL Scripts
OCI_DOCUMENT_UNDERSTANDING_DOCUMENT_CLASSIFICATION 2 hours ago	No SQL commands found	
OCI_AI_SERVICES_STRUCTURE 2 hours ago		
OCI_VISION_VIDEO_ANALYSIS 2 hours ago		
OCI_VISION_TEXT_DETECTION 2 hours ago		
OCI_VISION_OBJECT_DETECTION 2 hours ago		

Tasks

- Create Data Model Using AI

Create an Application

Name

ID

<new>

Create Application



Use Create App Wizard

Create a new application using the full Create Application wizard with advanced options.



Create App Using Generative AI

Enter a natural language prompt to create your application.



Create App From a File

Upload a CSV, XLSX, XML or JSON file, or copy and paste data, then create your application.



Create App From Quick SQL

Build your own data model or use an existing one and create a new application from it.



Browse Apps in Gallery

Install one of many Sample and Starter Apps from the Gallery.

New in APEX 24.1: APEX Assistant - Generate SQL from NL

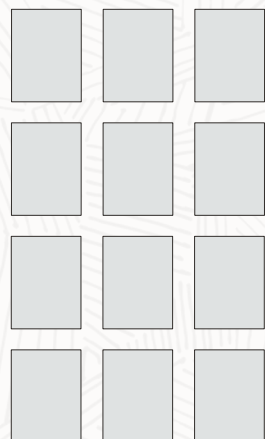
The screenshot displays the APEX Assistant interface within a development environment. On the left, the 'Code Editor - SQL Query' window shows a generated SQL query:

```
1 SELECT p.first_name,  
2        p.last_name,  
3        pp.medical_procedure,  
4        pp.amount_due,  
5        d.firstname,  
6        d.lastname  
7 FROM frc_patient_procedures pp  
8 JOIN frc_patients p  
9     ON pp.patient_id = p.id  
10 JOIN frc_doctors d  
11     ON pp.doctor = d.username  
12 WHERE pp.procedure_date >= SYSDATE - 60  
13 ORDER BY pp.procedure_date DESC;
```

On the right, the 'Query Builder' panel shows a chat interface. The assistant's message reads: "Hi there, I can help you author SQL based on tables and views in your current schema. What can I help you query?". The user's input is: "List of patient names, procedure descriptions, total amount, and doctor names for patient procedures in the past 60 days most recent ones first". The assistant's response is a SQL query, which is shown in a preview window with 'Copy' and 'Insert' buttons. The query is identical to the one in the code editor. At the bottom of the chat panel, there is a text input field labeled 'Type your message here' and 'Cancel' and 'OK' buttons.

Oracle APEX Natural Language to SQL (NL2SQL) for AppDev

Database Tables



Automatic
Synchronization



Automatic
Augmentation

APEX Meta Data

- Table and Column Information
- Labels
- Primary Keys (PK)
- Foreign Keys (FK)
- Object Prefixes
- Data Types
- Average Data Length
- Distinct Value Counts
- Null Column Counts
- Facet Type (range, checkbox)
- Recommended Queries
- Primary Display Column
- UI Default Information

Meta Data Source Material

Setup

APEX
NL2SQL

Identify Generative AI Service(s) per Workspace

Choose Open AI, OCI Generative AI Services, Cohere

- Click “APEX Assistant”
- Enter your query in natural language
 - You are an Oracle SQL query writer and Oracle SQL performance expert
 - Guardrails
 - Coding style
 - Instructions
 - Use only the following tables...
- Query Returned
 - Use the suggested SQL
 - Ask a follow up question with session context
 - Clear Chat and Start Fresh

APEX Assistant



↑ Utilities \ Quick SQL

Quick SQL

Help

Settings



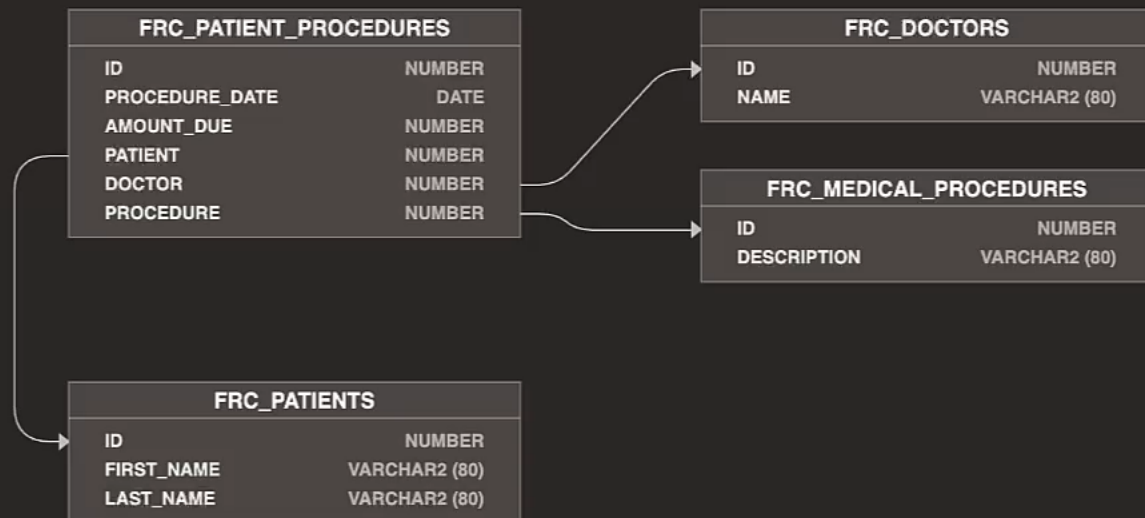
SQL

Diagram

Review and Run

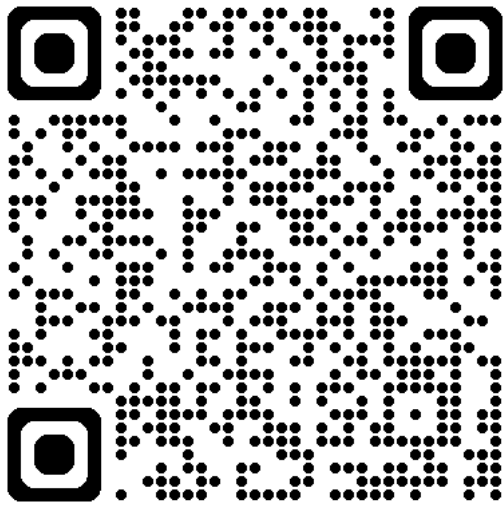


```
1 #prefix: frc
2 medical_procedures
3   description vc80
4
5 doctors
6   name vc80
7
8 patients
9   first_name vc80
10  last_name  vc80
11
12 patient_procedures
13   procedure_date date
14   amount_due num
15   patient /fk patients
16   doctor /fk doctors
17   procedure /fk medical_procedures
18
19
```

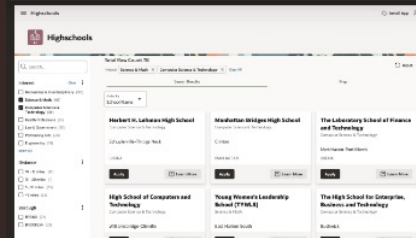


New Hands On Labs

Several focusing on APEX and AI



apex.oracle.com/hols

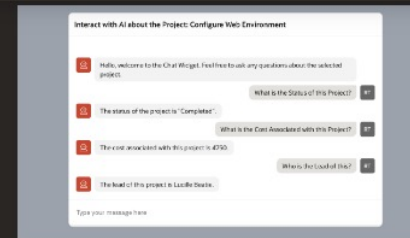


Build an Innovative Q&A Interface Powered by Generative AI

Learn how to integrate Generative AI Service and use it to develop a questions and answers feature for the New York High Schools APEX application.

Intermediate

1hr

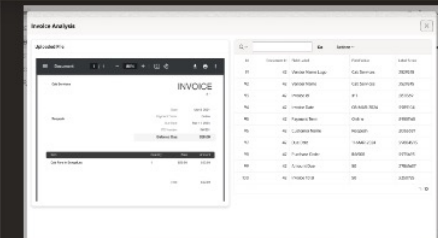


Smart Project Management with AI-Assisted Development

Build a dynamic application using the APEX AI Assistant to create the app and generate SQL queries, and implement your own version of an AI chat assistant.

Intermediate

2hrs

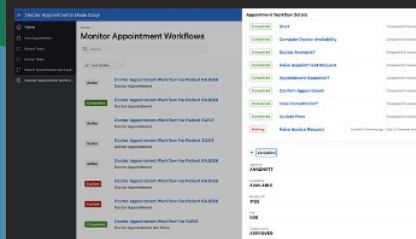


Automate Invoice Handling with OCI Document Understanding

Learn how to integrate Oracle APEX with OCI Document Understanding, and use it to process invoices and streamline expense management.

Intermediate

1hr

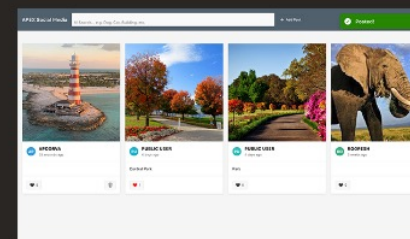


Workflow Lab

Learn all about Workflows in APEX by implementing an efficient system to schedule and manage doctor consultations.

Advanced

2hrs 35min

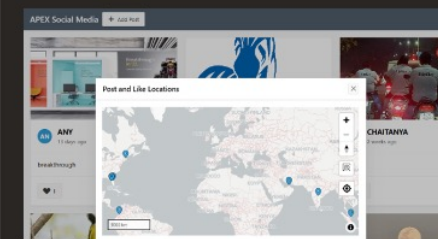


Build AI-Powered Image Search

Learn how OCI Vision is used to tap into the power of visual intelligence and enhance the Oracle APEX Social Media app for the classification of images.

Advanced

1hr



Build a Social Media App

Build a social media application in APEX using low-code practices and a simple approach to the development process.

Intermediate

1hr



APEX

App Builder
SQL Workshop
Team Development
Gallery

JH jayson hanes pm_demo

Sample Apps
Starter Apps
Utility Apps
Custom Apps

APEX PWA Reference
Oracle

Oracle APEX enables developers to build Progressive Web Apps (PWAs) that can be installed on any desktop or mobile device to deliver a more native app experience. This application serves as a reference for key PWA features in APEX and how you can use them in your own apps.

24.1.0

Install

Brookstrut Sample App
Oracle

The Brookstrut sample application analyzes a simplified stored data model and includes a feature to generate random data, accommodating everything from small to extra large data sets. It showcases Oracle APEX's capabilities in data reporting, navigation, and data presentation. This tool allows you to explore various Oracle APEX components, including faceted search, interactive reports, content row reports, and calendars.

24.1.0

Sample Application Search
Oracle

This application showcases the Application Search feature, introduced with APEX 22.2. Search Configurations and Search Regions allow developers to add robust search engine functionality to their APEX applications.

24.1.0

Sample Calendar
Oracle

This application highlights the native calendaring capabilities of Oracle APEX. It features a monthly calendar with stylized daily tasks. The dates can be changed using drag and drop, which is all declarative and easily created using native APEX wizards.

24.1.0

Sample Cards
Oracle

This application highlights Cards regions in Oracle APEX. Cards regions are a native region type. They provide developers with a powerful and flexible new way to display data in bite-sized blocks, ideal for use in faceted search, or presenting at-a-glance information.

24.1.0

Sample Charts
Oracle

This application highlights the charting capabilities of Oracle APEX. It demonstrates how you can enhance your applications to visually represent your data, using declarative and plug-in based charting solutions.

Update available: 24.1.0 (23.2.0)

Update

Sample Collections
Oracle

Sample Collections enables you to store rows of data for use within an Oracle APEX session. This database application illustrates how to use PL/SQL to create and manage collection-based session state.

24.1.0

Install

Sample Data Loading
Oracle

This application is built on simple EMP and DEPT tables to highlight how developers can define pages to allow end users to upload spreadsheet data into an existing table.

Update available: 24.1.0 (23.2.0)

Update

Sample Document Generator
Oracle

This application showcases the integration with the Oracle Document Generator Pre-built Function on OCI. It features examples of generating PDF documents from a combination of JSON data and MS Word templates.

24.1.0

Install

Sample Dynamic Actions
Oracle

This application demonstrates a number of different dynamic actions that can be incorporated into an application. These declarative client-side behaviors include simple examples for manipulating the display of components, style examples for changing the appearance of components, and server-side examples which interact with the database.

24.1.0

Install

Sample Email Authentication
Oracle

This application illustrates the use of email addresses and tokens are emailed to users at login time to verify their identities, instead of using passwords.

24.1.0

Sample File Upload
Oracle

Learn how to create Oracle APEX applications that include file upload and download. Upload files using dialogs as well as dedicated pages. See how to download files stored in Oracle database BLOB columns within database tables. Specifically see how to produce file download links in interactive reports, classic reports, forms, and dynamically created HTML content.

24.1.0

Install

Sample Interactive Grids
Oracle

This application showcases the features and functionality of the Oracle APEX Interactive Grid. Through its interactive grid sample pages, users can explore its versatile capabilities, such as comprehensive reporting, seamless data editing or intuitive pagination.

24.1.0

Install

Sample Maps
Oracle

This application contains numerous examples of visualizing coordinate data on a map. Use Map Markers, Lines or Polygons, or the Heat Map feature. The APEX Map Region can easily be combined with Oracle Spatial functionality (which is included in every Oracle Database) to perform a 'Within Distance Search', 'Nearest Neighbor Search', or other spatial analysis.

Update available: 24.1.0 (23.2.0)

Update

Sample Master Detail
Oracle

This application highlights the native master detail capabilities of Oracle APEX. The application contains four different master detail page layouts. The first two layouts display master detail in a single page using editable Interactive Grids. The last two layouts display master detail in two pages with mix of editable Interactive Grids, form items, classic reports and modal popups.

24.1.0

Sample Reporting
Oracle

This application highlights the reporting capabilities of Oracle APEX. You can create Interactive Reports, Interactive Grids, Faceted Search Reports, Cards Reports, and Classic Reports declaratively using SQL.

24.1.0

Sample REST Services
Oracle

This application showcases how to access external REST services from Oracle APEX. The app works on the sample RESTful Service, oracle.example.hr. The examples in this application illustrate how to create a simple tabular report on REST service data, how to filter, and how to add pagination.

24.1.0

Sample Trees
Oracle

Learn how to create a tree control using a SQL query. This application shows various methods of integrating tree controls into your Oracle APEX application.

24.1.0

Sample Workflow, Approvals, and Tasks
Oracle

This application highlights the key features of the Workflow, Approvals, and Tasks capabilities in Oracle APEX. It lets users manage changes to employees' salaries and jobs, provision a laptop for an employee, and manage employees' self-appraisals. All use cases involve human tasks requiring an action by an appropriate individual, some of which require an approval or rejection.

24.1.0

Universal Theme Reference
Oracle

This app introduces you to Universal Theme by providing an easy way to browse through the various templates, template options, and theme styles. The examples demonstrate how you can easily control the layout of your pages, to create a great looking application.

24.1.0



Vector Search Sample App

Vectors in AI Represent Semantics of Unstructured Data

Such as images, documents, videos, etc.



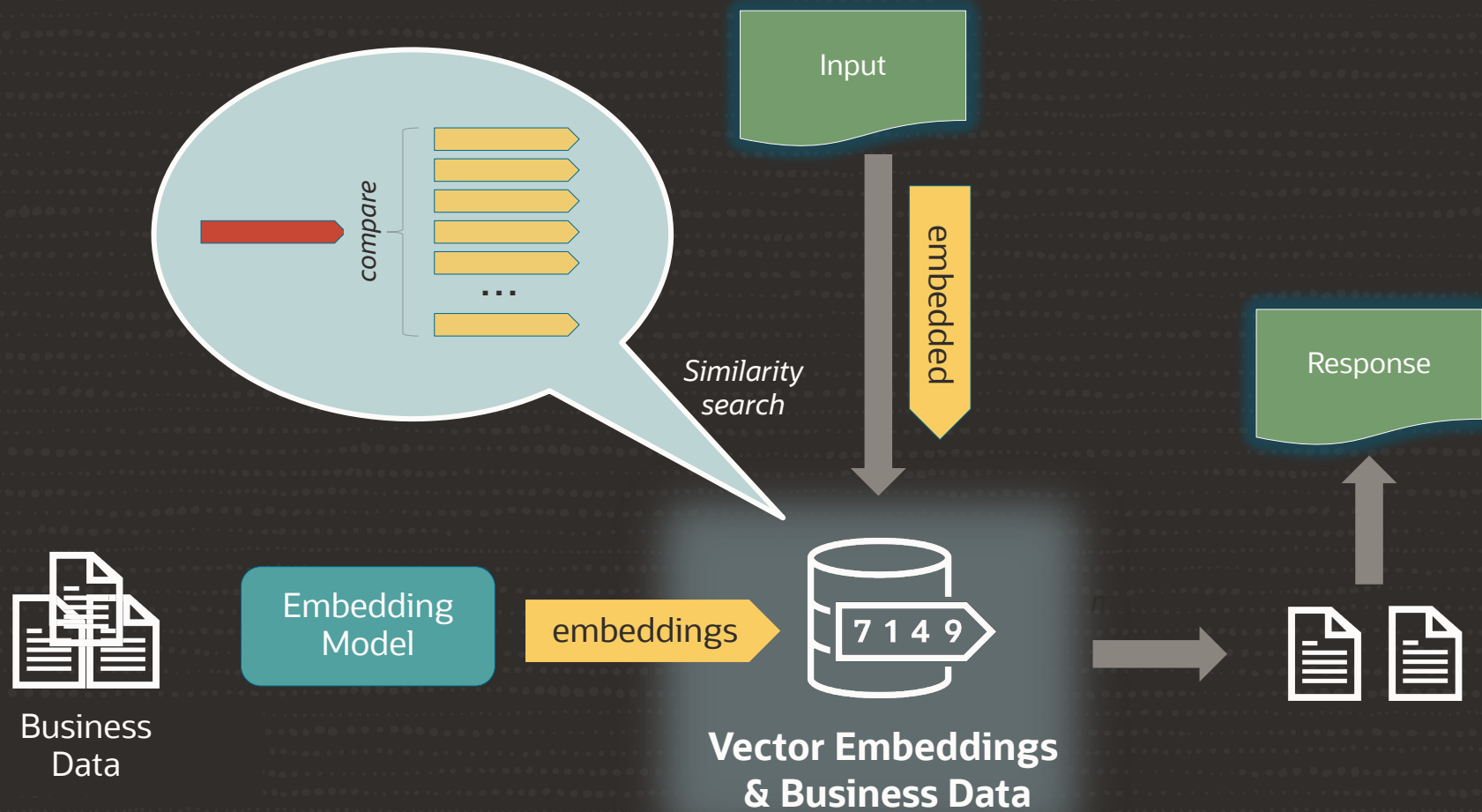
A vector is a sequence of numbers, used to capture the important "features" of the data

Vectors represent the **semantic content** of data, not the underlying words or pixels

Vectors are generated using deep learning embedding models

AI Vector Search

Search across your unstructured data

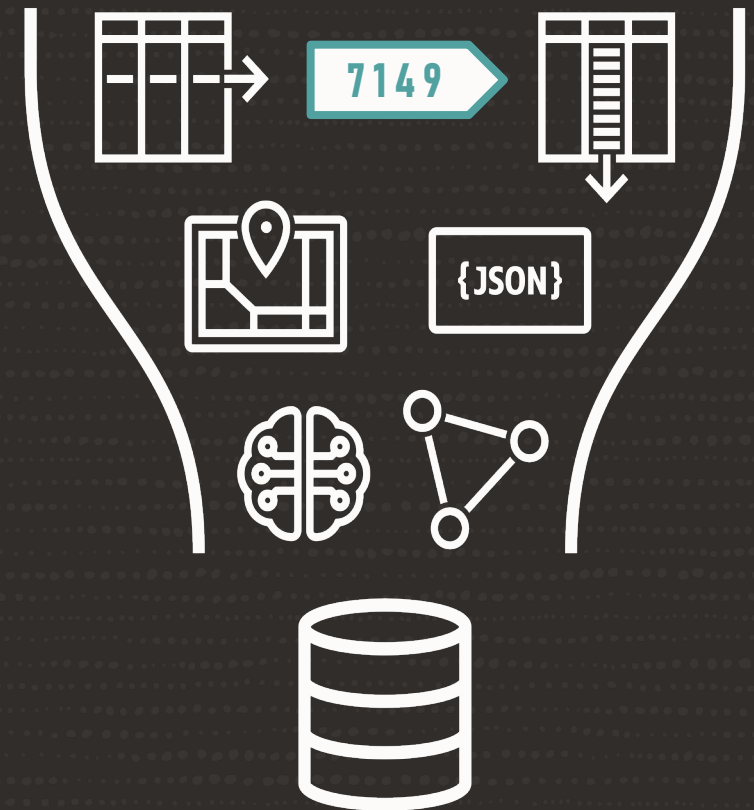


Introducing Oracle AI Vector Search

New set of capabilities in **Oracle Database 23ai**

Query business data alongside vector embeddings

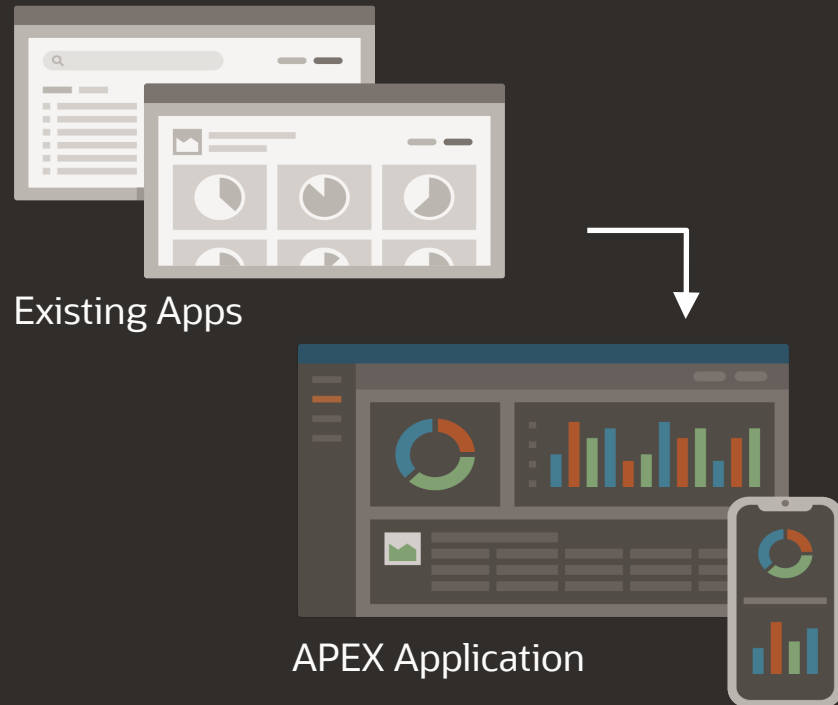
- **Generate** vector embeddings from unstructured data
- **New** VECTOR data type for storing vectors
- **New** SQL syntax and functions express similarity search with ease
- **New** Approximate search indexes packaged and tuned for high performance and quality



Visual Workflow Sample App (business process automation)

Create Fusion Integration

Integrating with Fusion Applications



- Quickly start Fusion Applications projects with the new **Fusion Integration** option, featuring pre-configured SSO, identity propagation, and testable REST setups.
- Easily build APEX apps using any **Fusion REST APIs**, including the latest **/api/boss** endpoints.
- Automatically discover supported **API operations** and **data profiles**.
- Optimize performance by delegating tasks like filtering and sorting to APIs, transferring only necessary data.

apex.oracle.com/go/fusion-app

APEX.oracle.com for more APEX + AI information!

Blogs + Videos + Training

apex.oracle.com/blog

apex.oracle.com/videos

apex.oracle.com/go/training

Thank You

Jayson Hanes

APEX Product Manager

@jaysonhanes



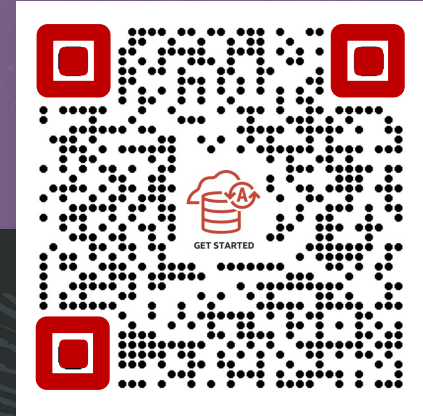




Q&A is open

Important links to bookmark

Links to get you started and to keep up to date with Autonomous Database



1 Get Started with ADB:
oracle.com/autonomous-database/get-started/

2 Join us:  bit.ly/adb-linkedin-grp  [@AutonomousDW](https://twitter.com/AutonomousDW)
 [Bluesky
autonomousedb.bsky.social](https://autonomousedb.bsky.social)

3 Got a question?
We are on stackoverflow
bit.ly/adb-stackoverflow

Join us on Developers Slack
(search #oracle-autonomous-database)
bit.ly/odevrel_slack

Final Thoughts

oracle.com/goto/adb-learning-lounge

The screenshot shows the Oracle Autonomous Database Learning Lounge page. At the top, there's a navigation bar with 'ASK TOM', a search bar, and links for 'Questions', 'Office Hours', 'Videos', 'Resources', and 'Classes'. Below this, there are tabs for 'Sessions', 'Series', and 'My Dashboard'. The main heading is 'Autonomous Database Learning Lounge'. To the right of the heading are buttons for 'Share', 'Register for Series', and 'Log In To Register'. The page describes the lounge series, offering free bi-weekly live webinars. It provides links for more information and lists other lounge series in different languages. Below this, there's a section for 'Upcoming' sessions, which includes three cards for upcoming webinars. At the bottom, there's a 'Replays' section with a 'Sort By' dropdown set to 'Newest' and four cards for replayed sessions. Red arrows point from the text 'Links', 'Upcoming', and 'Replays' to their respective sections on the page.

Links

Upcoming

Replays

Thank you for joining !!!

**AUTONOMOUS
DATABASE
LEARNING
LOUNGE**