This session will be recorded

Oracle Machine Learning

AskTOM Office Hours – Feature Highlight

Creating and using conda environments with third-party Python and R packages on ADB

with Hannah Nguyen and Sherry LaMonica

Host: Mark Hornick

Product Management, Oracle Machine Learning

Creating and using conda environments with third-party Python and R packages on ADB

Speakers: Hannah Nguyen and Sherry LaMonica

Oracle Machine Learning Notebooks now provides a conda interpreter to install third-party Python and R packages in custom-created conda environments for use within notebook sessions and Python and R embedded execution. With this feature, users can leverage the broader Python and R package ecosystems to augment Oracle Autonomous Database functionality. With embedded execution, users can run user-defined Python and R functions with these custom environments in engines spawned and managed by the database environment, while optionally taking advantage of OML4Py and OML4R data parallelism and task parallelism. Join us to learn about this new feature and see demonstrations of conda environment creation and use within OML Notebooks and REST/SQL invocation of user-defined Python and R functions.

Blog: Announcing custom third-party Python and R packages for use on Autonomous Database
https://blogs.oracle.com/machinelearning/post/third-party-python-and-r-packages-for-use-on-adb

Poll #1: Usage

What is your level of familiarity with Conda environments?

- I've used them in data science projects
- I'm familiar with what it is, but have never used it
- Interested to find out what this feature is all about

ORACLE

Oracle Machine Learning Feature Highlight

Creating and using conda environments with third-party Python and R packages on Autonomous Database

OML AskTOM Office Hours

Move the Algorithms; Not the Data!

Hannah Nguyen
Solution Engineer, NACTE Specialists

Sherry LaMonica
Oracle Machine Learning Product Management

Goals for Today

1. Conda Environments Overview
2. Benefits of Using Conda Environments
3. Conda Environment Lifecycle Management
4. Typical Workflow
5. Demo
6. Q&A

Machine learning is driven by freely available third-party software.

In practice, you rarely use one or two third-party libraries in a project. You will use many!

But how do you package these libraries in distinct environments?

Conda Environments

Overview

Oracle Machine Learning – Conda Environments

Package, dependency and environment management for Python and R

Conda

- An open-source package and environment management system
- Install, run, and update packages and their dependencies

Oracle Machine Learning

- Provides a conda interpreter to install third-party Python and R libraries
- Use within OML Notebooks sessions and OML4R/OML4Py embedded execution invocations
- Switch between R and Python environments within a given notebook

Benefits of Using Conda Environments in OML Notebooks

Leverage the Python and R package ecosystems to augment database functionality

Create and manage custom Conda environments

- Install Python and R libraries from Conda channels
- Use third-party library code directly in a notebook session

Run UDFs with third-party package functionality in embedded execution

- Engines spawned and managed by the database environment
- Leverage system-provided data parallelism and task parallelism

Conda environments saved in Object Storage

- Users load environments into notebook sessions
- Saved environments are available to all database users

Poll #2: Features

Which aspects of this feature do you find compelling? (Select all that apply)

- Using third-party packages in OML notebooks
- Using third-party packages in embedded execution
- Using the R interface
- Using the Python interface
- Using the SQL or REST interfaces

Conda Environment Lifecycle Management

Conda Interpreter Commands

Action	Command	ADMIN Only	ADB Specific
Create a Conda environment	create –n <env_name> <python_version>	✓	
Remove a user-created local environment	env remove –n <env_name>		
List environments	env list		
List all packages in active environment	list		
Activate a user-created local environment	activate –n <env_name>		
Deactivate the current environment	deactivate		
Install a third-party package	install –n <env_name> <package_name>	✓	
Uninstall a specific package from a Conda environment	uninstall -n <env_name> <package_name>	✓	
Display information about current Conda install	info		
View the command line help	COMMANDNAME --help		
Upload a Conda environment to Object Storage	upload --overwrite <env_name> --description 'some description' -t <name> <value>	✓	✓
Download and unpack a specific Conda environment from Object Storage	download --overwrite <env_name>		✓
List local environments available to the user	list-local-envs		
List all Conda environments in Object Storage	list-saved-envs --installed-packages -e <env_name>		✓
Delete a Conda environment from Object Storage	delete <env_name>	✓	✓

Workflow

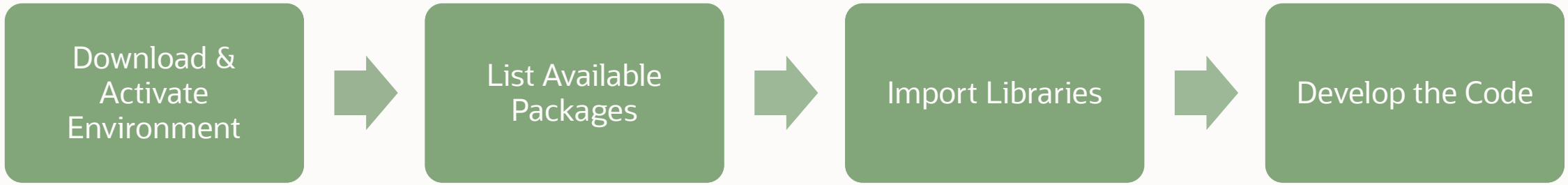
Creating and Using Conda Environments

Conda Environment Creation

Admin Workflow

Using Conda Environments

User Workflow



Demo

Creating and Using Conda Environments in OML Notebooks

Poll #3: Future use

What is your likelihood of using Conda environments in OML Notebooks?

- I plan to use it in future projects
- I need more information before I can start using this feature
- I don’t plan to use this functionality

Feel free to share the third-party libraries you will be using in the chat window!

For more information…

OML Webpage
https://oracle.com/machine-learning

OML Blog
https://bit.ly/omlblogs

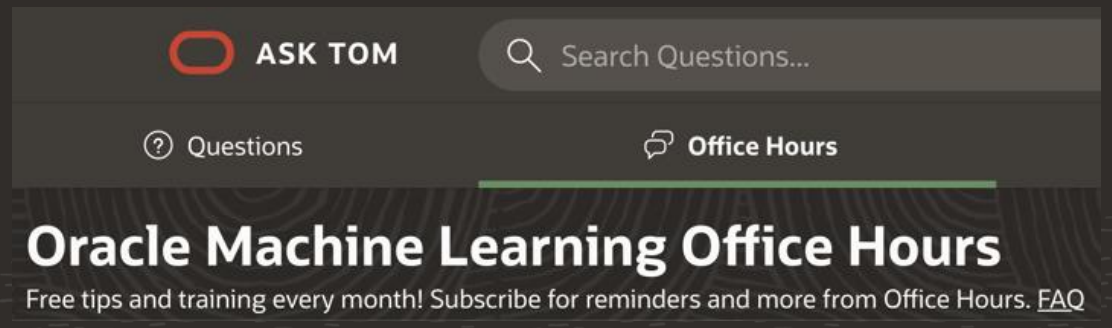
OML GitHub Repository
https://bit.ly/omlgithub

OML Office Hours
https://bit.ly/omlofficehours

Try Oracle LiveLabs
Overview: https://bit.ly/omlfundamentalshol

All OML: https://bit.ly/omllivelabs

OML Documentation
https://docs.oracle.com/en/database/oracle/machine-learning



Q&A

Questions and Answers

Q1: Are there standard conda environments pre-approved by CSSAP?

Only the base environment is approved by CSSAP. Admin users create the environments as needed for individual projects. A notebook can be used to create the script as highlighted in the demo.

Q2: Is it possible to upload an existing conda environment from outside of OML notebooks?

Conda environments must be created by ADMIN and persisted to the Object Storage bucket associated and fully managed by Autonomous Database. External conda environments cannot uploaded.

Q3: Can I install (overwrite) a specific version of Pandas?

You can install a specific version of a library in a conda environment, but it must be compatible with the Python version in OML notebooks, currently Python 3.10.

Q4: Is it possible to install libraries using pip?

Library installations using pip are not supported in OML notebooks.

Thank you

sherry.lamonica@oracle.com

mark.hornick@oracle.com