

HA400

ABAP Programming for SAP HANA

COURSE OUTLINE

Course Version: 17

Course Duration:

SAP Copyrights, Trademarks and Disclaimers

© 2021 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. Please see <http://global12.sap.com/corporate-en/legal/copyright/index.epx> for additional trademark information and notices.

Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors.

National product specifications may vary.

These materials may have been machine translated and may contain grammatical errors or inaccuracies.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP SE or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP SE or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of their dates, and they should not be relied upon in making purchasing decisions.

Typographic Conventions

American English is the standard used in this handbook.

The following typographic conventions are also used.

This information is displayed in the instructor's presentation	
Demonstration	
Procedure	
Warning or Caution	
Hint	
Related or Additional Information	
Facilitated Discussion	
User interface control	<i>Example text</i>
Window title	<i>Example text</i>

Contents

vii Course Overview

1 Unit 1: Introduction

1	Lesson: SAP HANA Basics and Technical Concepts
1	Lesson: Introducing the SAP HANA Studio
1	Lesson: ABAP and SAP HANA
1	Lesson: Introducing the ABAP Development Tools (ADT)

3 Unit 2: Taking ABAP to SAP HANA

3	Lesson: SAP HANA as Secondary Database– Access via Open SQL
3	Lesson: Code Checks to Prepare ABAP Code for SAP HANA
3	Lesson: Tools to Analyse Potential Performance Issues
3	Lesson: Guided Performance Analysis
3	Lesson: SQL Performance Rules for SAP HANA

5 Unit 3: Database Independent Code-to-Data

5	Lesson: Classical Open SQL and Its Limitations
5	Lesson: Enhanced Open SQL
5	Lesson: The Basics of Core Data Services in ABAP
5	Lesson: Associations in Core Data Services
5	Lesson: Outlook: More Interesting Features of CDS

7 Unit 4: SAP HANA specific Code-to-Data

7	Lesson: SAP HANA Native SQL Syntax
7	Lesson: ABAP-Managed Database Procedures
7	Lesson: ABAP Database Connectivity (ADBC)

9 Unit 5: Consuming SAP HANA Objects in ABAP

9	Lesson: Working with SAP HANA Objects in SAP HANA Studio
9	Lesson: Consuming SAP HANA Objects with Native SQL
9	Lesson: Using Proxy Objects to Consume SAP HANA Objects

11 Unit 6: Advanced Topics

11	Lesson: Transporting SAP HANA Objects with ABAP Transport Requests
11	Lesson: Using SAP HANA Full Text Search
11	Lesson: ABAP List Viewer with Integrated Database Access (ALV IDA)

13 Unit 7: Case Study: Optimize a Report on Flight Customer Revenue

13 Lesson: Optimizing a Report with CDS View and ALV IDA

15 Unit 8: Appendix

15 Lesson: Additional ABAP Language Enhancements

15 Lesson: External Session Debugging of ABAP-Managed Database
Procedures

Course Overview

TARGET AUDIENCE

This course is intended for the following audiences:

- Developer

Lesson 1: SAP HANA Basics and Technical Concepts

Lesson Objectives

After completing this lesson, you will be able to:

- Describe SAP HANA basics
- Understand the fundamental technical concepts of SAP HANA

Lesson 2: Introducing the SAP HANA Studio

Lesson Objectives

After completing this lesson, you will be able to:

- Know SAP HANA studio
- Connect SAP HANA studio to an SAP HANA system
- Understand SAP HANA catalog (schemas and tables)
- Know SAP HANA content (packages, views, procedures)

Lesson 3: ABAP and SAP HANA

Lesson Objectives

After completing this lesson, you will be able to:

- Explain the SAP HANA and ABAP evolution
- Identify SAP HANA-specific settings in ABAP Dictionary
- Describe the various code-to-data concepts

Lesson 4: Introducing the ABAP Development Tools (ADT)

Lesson Objectives

After completing this lesson, you will be able to:

- Work with ABAP Development Tools

Lesson 1: SAP HANA as Secondary Database– Access via Open SQL

Lesson Objectives

After completing this lesson, you will be able to:

- Access a secondary database via Open SQL

Lesson 2: Code Checks to Prepare ABAP Code for SAP HANA

Lesson Objectives

After completing this lesson, you will be able to:

- Use Code Inspector and ABAP Test Cockpit
- Understand the Runtime Check Monitor

Lesson 3: Tools to Analyse Potential Performance Issues

Lesson Objectives

After completing this lesson, you will be able to:

- Understand the reason for potential performance issues
- Use analysis tools to measure and compare runtime consumption
- Search for potential performance issues with Code Inspector and ABAP Test Cockpit
- Use SQL Trace (ST05) for in-depth analysis of database accesses

Lesson 4: Guided Performance Analysis

Lesson Objectives

After completing this lesson, you will be able to:

- Understand the SQL Monitor (SQLM)
- Use the Performance Tuning Worklist (SWLT)

Lesson 5: SQL Performance Rules for SAP HANA

Lesson Objectives

After completing this lesson, you will be able to:

- Know the performance rules and guidelines for SAP HANA

Lesson 1: Classical Open SQL and Its Limitations

Lesson Objectives

After completing this lesson, you will be able to:

- Know the limitations of classical Open SQL

Lesson 2: Enhanced Open SQL

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the motivation for enhanced Open SQL
- Use the new syntax of Open SQL
- Use new features of Open SQL in SELECT statements

Lesson 3: The Basics of Core Data Services in ABAP

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the concept of ABAP Core Data Services
- Use expressions, joins, aggregations, grouping and filtering in CDS views
- Use Open SQL to select data based on CDS views

Lesson 4: Associations in Core Data Services

Lesson Objectives

After completing this lesson, you will be able to:

- Use CDS views with associations

Lesson 5: Outlook: More Interesting Features of CDS

Lesson Objectives

After completing this lesson, you will be able to:

- Explain CDS view extensions
- Define and use CDS views with input parameters
- Explain authorization checks with CDS

Lesson 1: SAP HANA Native SQL Syntax

Lesson Objectives

After completing this lesson, you will be able to:

- Know the basics of SAP HANA native SQL syntax

Lesson 2: ABAP-Managed Database Procedures

Lesson Objectives

After completing this lesson, you will be able to:

- Understand ABAP-Managed Database Procedures
- Create an ABAP-Managed Database Procedure
- Call an ABAP-Managed Database Procedure in ABAP
- Debug an ABAP-Managed Database Procedure
- Know how AMDP enhancement works

Lesson 3: ABAP Database Connectivity (ADBC)

Lesson Objectives

After completing this lesson, you will be able to:

- Understand ABAP Database Connectivity (ADBC)
- Use ADBC to execute native SQL statements

Lesson 1: Working with SAP HANA Objects in SAP HANA Studio

Lesson Objectives

After completing this lesson, you will be able to:

- Analyze and test SAP HANA objects

Lesson 2: Consuming SAP HANA Objects with Native SQL

Lesson Objectives

After completing this lesson, you will be able to:

- Read from SAP HANA views with native SQL
- Call SAP HANA stored procedures with native SQL

Lesson 3: Using Proxy Objects to Consume SAP HANA Objects

Lesson Objectives

After completing this lesson, you will be able to:

- Define and use external views
- Understand Database Procedure Proxies

Lesson 1: Transporting SAP HANA Objects with ABAP Transport Requests

Lesson Objectives

After completing this lesson, you will be able to:

- Know the techniques for ABAP transport of SAP HANA objects
- Understand SAP HANA Transport Container (HTC)
- Use SAP HANA Transport for ABAP (HTA)

Lesson 2: Using SAP HANA Full Text Search

Lesson Objectives

After completing this lesson, you will be able to:

- Use SAP HANA full-text search
- Enable proposal search and fulltext search in a dictionary search help
- Describe SAP HANA linguistic search

Lesson 3: ABAP List Viewer with Integrated Database Access (ALV IDA)

Lesson Objectives

After completing this lesson, you will be able to:

- Understand the basics of SAP List Viewer with Integrated Data Access (ALV with IDA)
- Describe the differences between ALV with IDA and classical ALV
- Display data with ALV with IDA
- Use select options in the data retrieval of ALV with IDA
- Supply values for input parameters of views

Lesson 1: Optimizing a Report with CDS View and ALV IDA

Lesson Objectives

After completing this lesson, you will be able to:

- Optimizing a report with CDS view and ALV with IDA

Lesson 1: Additional ABAP Language Enhancements

Lesson Objectives

After completing this lesson, you will be able to:

- Use inline data declarations in ABAP code

Lesson 2: External Session Debugging of ABAP-Managed Database Procedures

Lesson Objectives

After completing this lesson, you will be able to:

- Debugging ABAP-Managed Database Procedures before NetWeaver 7.50