This sample chapter provides an overview of available resources and training courses to prepare you for the certification exam. It also details how to set up your own SAP HANA system to get practical experience. Finally, it covers techniques for taking the certification exam.

“SAP HANA Training”
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The Authors

Rudi de Louw
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Chapter 2
SAP HANA Training

Techniques You’ll Master

- Identify SAP Education training courses for SAP HANA
- Find related SAP courses
- Discover other sources of information and courses on the Internet
- Set up your own SAP HANA system to get practical experience
- Develop strategies for taking your SAP certification exam
In this chapter, we’ll provide an overview of options for available resources and training courses to prepare for your certification exam. We’ll look into SAP Education, which makes SAP HANA training courses available for each certification and provides related courses that can enhance your skills and understanding. We’ll also discuss various sources on the Internet that provide SAP HANA documentation, video tutorials, ways to get hands-on experience, and free online courses. Finally, we’ll review some techniques for taking the certification exam.

### SAP Education Training Courses

You can attend SAP official training courses in a couple of different ways. These training course options provide flexibility for learning and access to relevant materials, so you can customize your studies to your lifestyle.

These different types of training courses include the following:

- **Classroom training**
  The first and most obvious option is classroom training, in which you attend SAP HANA courses in a classroom with a trainer for a few days. Classroom training courses provide a printed manual and a system through which you can practice and perform exercises. At the end of the course, you’ll walk away with a better understanding of what is described in that training material. Classroom training is a popular option that allows individuals to focus on learning in an environment in which they can ask questions, perform exercises, discuss information with other students, and get away from their offices and emails.

- **Virtual classrooms**
  You can also attend SAP courses via virtual classrooms. The virtual approach is similar to training in real-life classrooms, but you don’t sit in a physical classroom with a trainer. Instead, your trainer teaches you via the Internet in a virtual classroom. You still have the ability to ask questions, chat online with other students, and perform exercises.

- **E-learning**
  You can participate in the same training courses via e-learning as well. In this case, you’re provided with a training manual and an audio recording of course presentations. However, you don’t have an instructor to ask questions of, and there is no interaction with others who are learning the same topic. Given that this type of training normally happens after hours, it requires some discipline.

### Training Courses for SAP HANA Certifications

Table 2.1 lists the SAP HANA training courses for the latest C_HANAIMP certification exams, the length of each course, and each course’s prerequisites, if any.

<table>
<thead>
<tr>
<th>Certification</th>
<th>SAP Training Course</th>
<th>Length</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_HANAIMP_14</td>
<td>HA100, collection 14</td>
<td>2 days</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>HA300, collection 14</td>
<td>5 days</td>
<td>HA100</td>
</tr>
<tr>
<td></td>
<td>HA301, collection 14</td>
<td>3 days</td>
<td>HA300</td>
</tr>
<tr>
<td>C_HANAIMP_15</td>
<td>HA100, collection 15</td>
<td>2 days</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>HA300, collection 15</td>
<td>5 days</td>
<td>HA100</td>
</tr>
<tr>
<td></td>
<td>HA301, collection 15</td>
<td>3 days</td>
<td>HA300</td>
</tr>
</tbody>
</table>

You can also look at the Learning Journey for SAP HANA modeling at http://saprs.co/v487600. This shows the preceding points to you in a semi-graphical chart.

In the next two sections, we’ll discuss SAP HANA training courses specific to the certification exams and additional courses related to SAP HANA that may prove useful in your learning.

### Tip

After you’ve joined the SAP Learning Hub, we recommend that you join the SAP HANA Modeling Learning room. This is by far the largest and most active room, and it’s very helpful while preparing for this exam. The SAP people managing this room have regular webinars on exam topics, provide sample questions, and quickly answer everyone’s questions.

You can find further details about the SAP Learning Hub at their website at https://training.sap.com/learninghub.
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The HA100 training course is the two-day introductory course that everyone must take, regardless of which direction you want to go with SAP HANA. HA100 provides a quick introduction to SAP HANA architecture, the different concepts of in-memory computing, and basic SAP HANA modeling concepts, data provisioning (how to get data into SAP HANA), and how to use SAP HANA information models in reports.

The HA300 training course goes into more detail on the modeling concepts and the security aspects of SAP HANA.

As of SAP HANA SPS 02 (collection 14), the HA301 training course was added. The SAP HANA advanced modeling topics, previously found in the HA300 course, were moved to this new three-day training course, expanded with more content, and these topics now contribute 25% to the C_HAMAIMP_15 certification exam. You’ll need to take the HA100, HA300, and HA301 courses to prepare for the certification exam.

**Tip**

All the answers to the associate-level SAP HANA certification exams are guaranteed to be somewhere in the official SAP training material.

Additional SAP HANA Training Courses

The following SAP training courses related to SAP HANA modeling can complement your skills and knowledge of SAP HANA:

- **HOHAM1**
  This two-day course teaches modelers that used SAP HANA 1.0 how to migrate their old (legacy) information models from SAP HANA extended application services, classic model (SAP HANA XS) to SAP HANA extended application services, advanced model (SAP HANA XSA). It’s a Virtual Live Classroom (VLC) training course, where the trainer teaches the course via an online platform. The course is practical, hands-on migration training—hence, the HO (for “hands-on”) in the name.

- **HA450**
  This three-day course merges SAP HANA modeling with the native application development that you can perform with SAP HANA’s application server. It teaches how you can take an SAP HANA information model, expose it as an OData or REST web service, and consume it in the JavaScript framework called SAPUI5. You can also write the C_HANADEV certification exam after attending this training course.

- **UX402**
  This course complements the HA450 training course. It focuses on developing user interfaces (UIs) with SAPUI5.

- **HA215**
  If you want to learn about SAP HANA performance tuning, the two-day HA215 course complements the HA100 and HA300 courses.

- **BW362**
  If you come from an SAP Business Warehouse (SAP BW) background, BW362 is a related course that might help you. This course shows how you can build information models with SAP BW on SAP HANA.

- **HA400**
  If you come from an ABAP background, you should think about attending the HA400 training course. It takes the knowledge that you gained in HA100, HA300, and HA301 and shows you how to apply that knowledge in your ABAP development environment. You’ll learn that the ways in which you access the SAP HANA information models and interface with the SAP HANA database are completely different from the ways to perform similar tasks in all the other databases you’ve used through the years.

SAP Education offers a wide variety of courses to enhance your skills and further your career. However, it’s important to know what resources are available outside the classroom as well. In the next section, we’ll look at additional resources for continued learning.

Other Sources of Information

You’ll find that there is no shortage of information about SAP HANA. In fact, so much information is available that it’s almost impossible to get through it all. To help focus your search, let’s look at some of the most popular sources.

SAP Help

SAP Help ([http://help.sap.com](http://help.sap.com)) is a valuable resource for your SAP and SAP HANA education. A lot of great documentation is provided on this website. At [http://](http://)
s-prs.co/v487608, you’ll find all available documentation provided in PDF format (see Figure 2.1) in the Documentation Download area.

**Figure 2.1 SAP HANA Documentation on SAP Help**

Useful PDF files include the following:

- **SAP HANA Modeling Guide for SAP HANA XS Advanced Model**
  We highly recommend this modeling guide, which provides the foundation for working with and building SAP HANA information models. There are two other modeling guides as well, namely for SAP HANA Studio and the Web Workbench. We recommend that you focus on the SAP HANA XSA version.

- **SAP HANA Interactive Education (SHINE) for SAP HANA XS Advanced**
  This guide is found when you click on the View All button in the Development area of the screen. SHINE is a demo package that you can install into your own SAP HANA system or your company’s SAP HANA sandbox system. It provides a lot of data and models, with examples of how to create good information models. The example screens in this book make use of the SHINE package. We’ll look at SHINE later in this chapter.

- **SAP HANA Security Guide**
  This guide tells you everything you need to know about security in more detail. We’ll discuss what you need to know about security for the exam in Chapter 13.

- **SAP HANA Troubleshooting and Performance Analysis Guide**
  Learn how to properly troubleshoot your SAP HANA database and enhance overall performance with this guide.

- **What’s New in the SAP HANA Platform 2.0**
  This document lists the new features in the Support Package Stacks (SPSs) of SAP HANA 2.0 since SPS 00.

- **SAP HANA reference guides**
  There is an entire section of reference guides that provide more specific and focused discussions of particular SAP HANA topics:
  - SAP HANA SQL and System Views Reference
  - SAP HANA XS JavaScript Reference
  - SAP HANA XS JavaScript API Reference
  - SAP HANA XS DB Utilities JavaScript API Reference
  - SAP HANA Business Function Library (BFL) Reference
  - SAP HANA Predictive Analysis Library (PAL) Reference

- **SAP HANA Developer Quick Start Guide**
  This specific developer’s guide is presented as a set of tutorials.

- **SAP HANA Developer Guide for SAP HANA XS Advanced Model**
  We recommend reviewing this guide, especially because development and information modeling are closely linked in SAP HANA. This guide teaches you how to build applications in SAP HANA, write procedures, and more. This includes information on building UIs using SAPUI5.

For some of these documents, it might be helpful to have an actual system to play with because some guides provide step-by-step instructions for certain actions. We discuss how to get your own SAP HANA system in a later section.
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SAP HANA Home Page and SAP Community

The main website for SAP HANA is found at www.sap.com/products/hana.html, which offers the latest news about SAP HANA and its different use cases. Along with the SAP HANA home page, the SAP Community provides a central location for members of different SAP communities and solution users. At http://sprs.co/v487609, you can ask questions about your own SAP HANA system, and SAP employees will answer them. In addition, take a look at http://sprs.co/v487610 where many other community support options are described.

SAP HANA Academy

From http://sprs.co/v487611 or using a Google search, you can find a link to the SAP HANA Academy. The SAP HANA Academy area of YouTube provides hundreds of free video tutorials on all topic areas of SAP HANA, which you can access directly via www.youtube.com/user/saphanaacademy/playlists. Figure 2.2 shows the playlists screen for the SAP HANA Academy.

These videos are created by SAP employees who perform actual tasks on an SAP HANA system. If you’ve never made a backup of an SAP HANA system, for example, you can search for a video on how to do just that, with step-by-step instructions performed on an actual system.

Because there are so many video clips available, we recommend that you select the Playlists option from the YouTube menu bar, as shown in Figure 2.2. Alternatively, you can go to the URL provided.

With each new SAP HANA release, new videos are added to the SAP HANA Academy YouTube channel, as shown in the SAP HANA SPS - What’s New row in Figure 2.2.

You’ll also see other playlists here that are worth investigating, for example, Application Development and Delivery (Application Developer) and Predictive Analysis (Data Scientist), as shown in Figure 2.3. Many of the advanced modeling topics discussed in the HAN01 training course, such as graph and spatial modeling, are examined in individual playlists.

Figure 2.2 SAP HANA Academy at YouTube

Figure 2.3 Playlists for Application Development and Predictive Analysis
You can also find videos on the SAP HANA Academy for building solutions. On the Playlists page, look for a playlist called Building Solutions: Live5 under the Building Solutions playlist collection (see Figure 2.4). This will guide you to build a complete social media analysis solution for analyzing Twitter feeds in real time.

Figure 2.4 Playlists for Building Solutions in SAP HANA Academy

As noted earlier, the http://help.sap.com website provides all the PDFs for you to read, which is great if you like reading and you want the PDFs on your tablet or phone, for example. On the other hand, the SAP HANA Academy YouTube channel is good if you prefer visual learning, and it may be more practical.

openSAP

Next up to consider is the openSAP website (https://open.sap.com/), which provides many free training courses on a large variety of SAP topics (see Figure 2.5). This website frequently adds new online training courses, some of which focus on SAP HANA (http://s-prs.co/v487612). When new training courses become available, you can enroll in them. Every week, you’ll receive a few video clips. These courses are normally four to six weeks long, and every week you’ll take a test. All the tests together are worth 50% of your total score. In the last week, you take an exam that is worth the other 50% of your score. At the end of the course, you receive a certificate of attendance, and if you performed well, the certificate will show your score. If appropriate, the certificate will also show that you were in the top 10% or top 20% of your class.

Note
The openSAP certificates don’t hold the same weight as the official SAP Education certifications.

Figure 2.5 openSAP Website

After you complete one of these free online courses, you can retake the tests or exams for a fee, but you can still access all of the other course materials for free. You can always download the video clips, the PowerPoint slides, and the transcripts for your records.

Hands-On with SAP HANA

Everyone learns differently. Some people like visuals, others learn by listening, and still others learn by doing. In this section, we look at how to gain some hands-on experience with your own SAP HANA system, projects, and data. We’ll begin with the different ways you can personally access an SAP HANA system.
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Where to Get an SAP HANA System

On the SAP Developer Center site (https://developers.sap.com/), you can download a free SAP HANA system or access your own SAP HANA server in the cloud via the following link: http://s-prs.co/v487613, as shown in Figure 2.6. To do so, select Install your free SAP HANA instance on this page.

Selecting that option takes you to the page at http://s-prs.co/v487614, where you’ll find links to download the free SAP HANA, express edition; sign up for the free SAP Cloud Platform; or use Microsoft Azure, Amazon Web Services (AWS), or Google Cloud Platform (GCP) for your own hosted SAP HANA, express edition (see Figure 2.7).

The interactive graphic in Figure 2.7 will help you decide which of the many options to choose. When preparing for the certification exam, you’ll need the Server + XSA Applications option on the right side. You can install your own system using the On-Premise options or get a cloud-hosted solution via the Cloud Providers options.

Figure 2.7 SAP HANA System Options

In the next sections, we’ll look at the following options in greater detail: using a free SAP Cloud Platform account, paying a cloud provider for the computing resources, and two options for running SAP HANA on your own machine.

Free SAP Cloud Platform Account

Let’s start with the cheapest and easiest way to get your own SAP HANA system: the free SAP Cloud Platform account. Figure 2.8 shows https://cloudplatform.sap.com, where you can get a free account on SAP Cloud Platform. After a quick registration process, you’ll gain access to SAP Cloud Platform.

To learn how to set up your own account on SAP Cloud Platform, you can read the Get Started with SAP Cloud Platform information at http://s-prs.co/v487615.

The free account on SAP Cloud Platform has restrictions. You don’t get a lot of memory for loading large data sets, and the cloud platform is shared with many other users. SAP Cloud Platform is an excellent choice to get going quickly, and it doesn’t cost you anything. However, for the purposes of preparing for the certification exam, one of the other options will probably be better.
The next option is to get your own SAP HANA system on AWS, Microsoft Azure, or GCP. While SAP HANA, express edition is free from SAP, you’ll need to pay these cloud providers for hosting your solution.

All these cloud offerings are ideal for learning more about SAP HANA in a practical manner. They’re quite inexpensive, as long as you remember to switch things off when you’re finished—that is, essentially pressing a pause button on your SAP HANA system. Otherwise, the cloud providers will continue charging you for the CPU, memory, network, and disk space being used. You can also put a limit on your finances to ensure you don’t go over your budget.

You can create an account on any of these cloud offerings via your own account with the respective companies. An easy way to create your own SAP HANA system on any of them is by using the SAP Cloud Appliance Library at https://cal.sap.com. Registration is free on this website. After you have logged on, when scrolling down the page, you’ll see a description for SAP HANA, express edition, with a Create Instance button.

You can select with which Cloud Provider you want to create your SAP HANA system, as shown in Figure 2.9. You can select the size of the SAP HANA server you require as well. You can play around with the various options, and based on the options you select, the cost per hour and the total monthly costs will be displayed.

The SAP Cloud Appliance Library will also allow you to automatically switch your SAP HANA system on and off at predefined times. The savings are also automatically reflected in the monthly cost calculations.

When you’re satisfied with your choices, you can ask the SAP Cloud Appliance Library to create your SAP HANA system automatically for you with your chosen cloud provider.

If you have a Microsoft Visual Studio subscription, you get a certain amount of credit each month for Microsoft Azure Cloud, which you can use to pay for your SAP HANA, express edition system. Figure 2.10 shows you how to spin up an SAP HANA, express edition system. Simply click on Create a resource in the top left of the screen; type “SAP HANA” in the search box; select the SAP HANA, express edition (Server + Applications) option from the dropdown; and click the Create button on the bottom right of the screen shown in Figure 2.10.
Running SAP HANA, Express Edition on Your Laptop or PC

The most-asked question from students through the years was for a copy of SAP HANA that they can install on their laptops. You can now do exactly that! SAP HANA, express edition is compiled so that it can run on your laptop with all the functionality of the full version of SAP HANA while using less memory. Best of all, it’s free for both development and productive use up to 32 GB of RAM.

SAP HANA, express edition is available as both a binary installer and a virtual machine image to get you started quickly, but the easiest way to get started is to use the virtual machine image. In the following steps, we’ll discuss how to get you up and running quickly.

Tip

The screens and examples in this book were created with SAP HANA, express edition.

1. From http://s-prs.co/v487616, click on the Free Installation button, shown earlier in Figure 2.6, or the buttons in the On-Premise block, shown earlier in Figure 2.7.

The alternative is to go directly to http://s-prs.co/v487617, register, and get the download manager for SAP HANA, express edition. This program requires Java.

2. When you start the download manager for SAP HANA, express edition, as shown in Figure 2.11, you can choose between a Virtual Machine image and a Binary Installer. The default is the Virtual Machine image.

3. Select the functionality you want to use with your copy of SAP HANA, express edition.

Note

You need a minimum of 8 GB memory to run SAP HANA, express edition. You might need 16 GB if you want to use SAP HANA XSA. We recommend that you install the Server + applications virtual machine, as shown in Figure 2.11. This option includes SAP HANA XSA and is what we use in this book.
Options you might select include the following:
- The first selection on the list is the Getting Started with SAP HANA express edition (Virtual Machine Method) PDF file. This document will help you install your copy of SAP HANA, express edition. You can also follow the instructions at http://s-prs.co/v487618.
- The Virtual Machine option already includes the SUSE Linux Enterprise Server (SLES) operating system. If you use the Binary Installer option, you’ll need to download a certified operating system. See the next section for links.

4. Ensure you have the VMware Workstation Player (for Windows and Linux) or VMware Fusion (for Mac).

**Tip**
The VMware Workstation 15 Player is free for personal use and can be downloaded at their website at www.vmware.com/go/downloadplayer/.

After you’ve installed SAP HANA, express edition, you need to set up the environment so that you can start using it for information modeling. You can get guidance by following the tutorials for SAP HANA, express edition at http://s-prs.co/v487619 or by following the steps described in the PDF you downloaded previously per Figure 2.11. However, the following steps will help you quickly set up your SAP system so that you can get to the screens we’ll show in this book:

1. Make sure your hosts file contains a reference to hxehost as described in the Getting Started guide.
2. Check if the XS engine is up and running by opening http://hxehost:8090 in your browser.

**Tip**
We recommend that you use the Google Chrome browser.

3. Check that SAP HANA XSA and services are running by opening https://hxehost:39030. This will show you a list of apps that are running and their web addresses. You can open any of these apps by clicking on their web addresses. Check that the xsa-cockpit and webide apps are running as shown in Figure 2.12. If you see the web app running, it means you’ve also installed the SHINE demo application. Many of the demo screens we show in this book use the SHINE demo application.

4. Create your own user by opening the SAP HANA XS Advanced Cockpit app screen and logging in with the XSA_ADMIN user. You’ll see a web application, as shown in Figure 2.13. Click User Management, and create a new user by clicking on the New User button.
5. Add your new user to the development space.
6. Open the Organizations screen, and select HANAExpress. You’ll see two spaces named development and SAP, as shown in Figure 2.14.

7. Select the development space. Select the Members option on the menu. You should see that the XSA_ADMIN and XSA_DEV users are already in this space.
8. Click on the Add Members button, and enter your user name.
9. Select the Space Developer checkbox next to your user name, and click the OK button. Your user is now added to the development space.
10. Open the webide app. We’ll spend a lot of time in SAP Web IDE for SAP HANA. In Chapter 4, we’ll describe it in more detail.
11. Log in with your new user name. SAP Web IDE for SAP HANA won’t have any content for your new user. To get up and running quickly, you can clone or import the source code of the SHINE SAP HANA XSA demo application. A few tips are as follows:
   - The easiest way to get the source code for SHINE is to clone it from GitHub. Open the menu, and select File • Git • Clone Repository. When asked for a Git Repository, enter the public GitHub address where SAP HANA SHINE resides, that is, “https://github.com/SAP/hana-shine-xsa”. SAP Web IDE for SAP HANA will download all the source code, information models, and design-time objects for you.
   - If you’ve already installed SHINE during the SAP HANA install, open the Web app, and click on the icon in the top-right corner. This will download a ZIP file to your local machine with the SHINE source code. In the webide app, open the menu, and select File • Import • File or Project. Then select the ZIP file from SHINE on your local machine.
12. Next, set the space where you want to work in the Project Settings for your project. As shown in Figure 2.15, select the second-level node (which is your project), and right-click on the name. In the popup context menu, select Project • Project Settings.
13. On the next screen, select Space, and then choose the development space from the dropdown list. This is the same space you added your user to earlier. Click Save and then Close.
14. The last step is to build your SHINE application. At the moment, you only have the source code, but you want it to create a schema, users, tables with data, information models, and much more for you. This is accomplished by building your project. As shown in Figure 2.16, select the second-level node (your project), and right-click on the name. In the popup context menu, select Build • Build.
15. After the core-db module has been built, you can open it. Open the src folder, then the models folder, and open the PRODUCTS.hdbcalculationview model. You should see something that looks like Figure 2.17.
Building an SAP HANA System

You can also install SAP HANA on a server. You'll need some certified hardware, an operating system, and the SAP HANA software. Note that you'll need a registered S-user name and password before you can download the SAP HANA software. If you’re an existing SAP customer or SAP partner, you can ask your system administrator for a logon user.

The requirements for the hardware and how to install the SAP HANA software can be found at http://s-prs.co/v487620.

Note
It’s recommended that you use a machine with a minimum of 24 GB or 32 GB of memory. If you have less memory, you should use SAP HANA, express edition.

The certified operating systems for SAP HANA are SLES for SAP Applications and Red Hat Enterprise Linux for SAP HANA. You can find the SLES for SAP Applications at www.suse.com/products/sles-for-sap/, or you can get a copy of Red Hat Enterprise Linux for SAP HANA from https://developers.redhat.com/products/sap/overview/.

You’ll also need to download a copy of the SAP HANA software from http://s-prs.co/v487621. In the alphabetical list of products, select H, choose SAP HANA Platform Edition, and then follow the instructions in installation guides on http://s-prs.co/v487620.

Project Examples

After you have your own SAP HANA system, the next step is to start using it. In this section, we’ll discuss how to start working on SAP HANA projects and how you can use the SHINE demo package or create your own project.

Using the SHINE Demo Package

One option to get some practice in SAP HANA is to explore the content available in the SHINE demo package. We’ll use the SHINE demo throughout this book. It’s fully documented and is used by SAP as an example for how to develop SAP HANA applications. You can see what the SHINE demo application looks like in Figure 2.18.
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Figure 2.18  SHINE (SAP HANA Interactive Education) for SAP HANA XS Advanced Model Screen

The SHINE documentation can be found at http://s-prs.co/v487620 in the Development area by clicking the View All button.

Creating Your Own Project

You can also think up your own projects. You can start very simply by just learning to work with individual topics discussed in the book, such as fuzzy text search, currency conversion, input parameters, hierarchies, and spatial joins. You can also add some security on top of this, for example, to limit the data for a single user to just one year.

The next step is to think about creating a report that can analyze the performance of a particular data set. This is a good exercise because you’ll have to take end-user requirements and learn how to translate them into the required SAP HANA information models. Then, you’ll design and create these models. Finally, you can expand these information models into an application.

You can also look at incorporating something such as SAP Lumira to easily create attractive storyboards. You can download a free copy of SAP Lumira from https://saplumira.com/.

Where to Get Data

SAP HANA can process large amounts of data. To get hands-on practice in the SAP HANA system, you’ll want some sort of data to play with. There are a couple of places where you can acquire such data:

- **SHINE demo package**
  The SHINE demo package is a great place to get large data sets. To do this in the SHINE package, use the Data Generator option (the first option in Figure 2.18, shown previously).

- **Datahub**
  Datahub is a website and free open data management system that can be used to get, use, and share data. At https://datahub.io/ (see Figure 2.19), you can find more than 10,000 data sets. (If you can’t find what you’re searching for, look at the old site at https://old.datahub.io/dataset.)

  Figure 2.19  Datahub

- **US Department of Transportation database**
  If you want a larger data set to play with, you can download the US Department of Transportation database on flights in the United States at http://s-prs.co/v487622. It has more than 50 million records, with more than 20 years of data,
including departure airport, destination airport, airline, flight number, airborne time, flight delays and cancellations, and so on. You can use this data to experiment with the predictive capabilities of SAP HANA described in Chapter 10, for example, to predict whether your US flight will be delayed and by how much.

**Exam Questions**

Now, we’ll change gears a bit and look at the SAP certification exams and how to approach them. Let’s look at the examination question types and some tips and hints about how to complete the certification exam.

**Types of Questions**

An international team sets up the SAP HANA certification exams. All the questions are written in English, and all the communication is in English. Because the exam teams are international, a lot of attention is focused on making sure that everybody will understand what is meant by each question, avoiding possible double meanings or ambiguities. Some of the exams get translated into other languages, so simple and straightforward questions work best.

Figure 2.20 shows three types of questions that you’ll find in the certification exam.

![Figure 2.20 Three Types of Certification Exam Questions](image)

The first question is multiple choice. The radio buttons indicate that you can only choose one of the four available answer options. There will be three or four different options, with only one correct answer. (Most of the time there will be four answer options. The newer exams have a few questions that only have three answer options for this type of question. The older exams always had four options.)

The other two questions are called multiple-response questions, of which there are two types:

- With the first type of multiple-response question, there are four possible answers, and there will always be two correct answers and two incorrect answers. In the exam, this will be indicated by the words, “Note: There are two correct answers to this question.”

- The other type of multiple-response question has five possible answers, of which three will always be correct, and two will be incorrect; you must select three correct answers. Above the answers, you’ll see the words, “Note: There are three correct answers to this question.”

Both types of multiple-response questions use checkboxes, and you must select however many answers are correct.

All three types of questions have exactly the same weight. You either get a question right or you get it wrong. It’s a binary system: 0 or 1.

For a multiple-response question with two correct and two incorrect answers, you must select two answers. If you select three answers or one answer, you don’t receive any points. If you select two answers and they are the correct two answers, then you earn a point.

**Tip**

Select as many answers as are required! If you’re certain that an option is correct, select it. If you’re doubtful about an answer, at least select the correct number of answers. If you don’t select anything, you won’t earn any points. Even if you plan to come back to the question later, we still recommend that you select the exact number of answer options required.

Multiple-choice questions normally make up the majority of the questions for the associate-level core exams. More than half of the questions will have only one correct answer.
Note
In the certification exam, there are no fill-in-the-blank questions. There are also no true or false questions in the certification exam, but we'll use true or false questions in this book for training purposes.

The questions and the answers themselves appear randomly. In other words, two people could be taking the same exam, sitting next to each other, and the order in which the questions appear for each person would be different. In addition, for similar questions, the order of A, B, C, and D (the answer options) is different for different people. Because answer options are randomized, you'll never find any questions that list "All of the above" or "None of the above" as a possible answer.
The questions in the SAP certification exams tend to be very short and to the point. All extra words and descriptions have been cut away, ensuring that you'll have enough time to complete the exams. We've never heard anyone complain about the time limits in the SAP HANA certification exams.

Because the questions are to the point, every word counts. Every word is there for a reason and has a purpose, so don't ignore any word—especially words such as always, only, and must. Always indicates on every occasion, only means that no other options are allowed, and must indicates something that is mandatory. In the answer options, you could see some optional actions that would be valid actions in normal circumstances, but if they aren't mandatory, they are incorrect answers for questions asking what you must do. Therefore, for questions using the word must, pay attention to optional steps versus mandatory steps.
The certification exams use a minimum of negative words, which are only used for troubleshooting questions. All negative words in a question are written in capital letters—for example, “You did something and it is NOT working. What is the reason?” You can see an example of this in the first question in Figure 2.20 shown earlier in this section.

Tip
Don't just learn the facts as if everything will always work properly. Systems break in real life, and you need to know why they didn't work and how to fix or troubleshoot the problem. There will be questions in the exam to test this knowledge.

Now that we've looked at the general structure of SAP certification exam questions, let's look at the strategy of elimination in the exam.

Elimination Technique
Experience has shown that the elimination technique can be useful for answering exam questions. In this technique, you start by finding the wrong answers instead of finding the right answers.

When creating exams, it’s fairly easy to set up questions, but it’s hard to think up wrong answers that still sound credible. Because it’s so difficult to write credible wrong answers, it’s normally easier to eliminate the wrong answers first. As Sherlock Holmes would say, whatever remains, however improbable, must be the truth.

To show how efficient this technique can be, look at the multiple-response question with five different options (refer to Figure 2.20, right). There are three correct and two incorrect answers, so it saves you time to find the two incorrect ones, rather than trying to find the three correct answers.

Tip
Make sure you know which keywords apply to which area. The wrong answers could come from an unrelated area, but the words sound like they might belong to the area in which the question is asked. Don’t confuse the words from different topic areas.

Bookmark Questions
In the certification exam, you can always bookmark questions and return to them later. Figure 2.21 shows the sample exam you can write for C_HANAIMP_15. You can see the Assessment Navigator block in the bottom-right corner of the screen. You’ll notice that the top-left corner of question 1 is marked. By clicking on the bookmarked question in the Assessment Navigator, it will take you directly to that question.

If you’re not confident about a question, mark it. We still recommend that you complete the right number of answer options: If two answers are required, fill in two options. If three are required, select three options. Then, mark the question so that you can review it later.

Tip
Watch out when you do the review; your initial choice tends to be the correct one. Remember, don’t overanalyze the question.
Now, let’s turn our attention to some general exam strategies. Implementing test-taking strategies will help you succeed on the exam.

**General Examination Strategies**

The following are some good tips, tricks, and strategies to help you during an exam:

- If you have the SAP training manuals, read them twice. Pay attention to pages with lots of bullet points because that means there are normally lots of options, which are likely good sources for questions. In addition, look carefully at the Caution boxes.

- Make sure that you’ve answered all the questions and that you’ve selected the correct number of answer options. If the question says that three answers are correct, then make sure that you’ve marked three—not four or two.

- Occasionally, you’ll find answer options that are opposites—for example, X is true, and X is NOT true. In that case, make sure you select one of the pair.

- In our experience with SAP HANA certification exams, the answers from one question don’t provide answers to another question. SAP Education is careful to make sure that this doesn’t happen in its exams.

- Make sure that you’ve answered all the questions and that you’ve selected the correct number of answer options. If the question says that three answers are correct, then make sure that you’ve marked three—not four or two.

- Occasionally, you’ll find answer options that are opposites—for example, X is true, and X is NOT true. In that case, make sure you select one of the pair.

- In our experience with SAP HANA certification exams, the answers from one question don’t provide answers to another question. SAP Education is careful to make sure that this doesn’t happen in its exams.

- Watch out for certain trigger words. Alarm bells should go off when you see only, must, and always.

- Look out for impossible combinations. For example, if a question is about measures, then the answer can’t be something to do with dimension calculation views because you can’t find measures for such views.

- Some words can be different in different countries. For example, some people talk about a right-click menu, but in other places in the world, this same feature is known as a context menu. This is the menu that pops up in a specific context, and you access this menu by right-clicking.

- Make sure you get a good night’s rest before the exam.

**Summary**

You should now know which SAP Education training courses you can attend for your certification examination, which related SAP courses will complement your knowledge and skills, and where to get hands-on experience. In addition, we introduced many free sources of information on the Internet, training videos on YouTube, and online courses at openSAP.

You can now form a winning strategy for taking your SAP certification exam. In the next chapter, we’ll begin looking at exam questions and concepts, focusing first on the technology, architecture, and deployment scenarios of SAP HANA.
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First-hand knowledge.

Rudi de Louw is head of the SAP Co-Innovation Lab at SAP in South Africa where he supports SAP partners in building or improving their business ideas and systems with SAP platforms such as SAP HANA, SAP Cloud Platform, and SAP Leonardo. In this role, he also helps partners extend the integration of their current business products with available and emerging SAP technologies.

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