



**Salesforce Certified Force.com Advanced  
Developer  
Study Guide**  
Summer '15

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## Section 1. Purpose of this Study Guide

This study guide is designed to help you evaluate if you are ready to successfully complete the Salesforce Certified Force.com Advanced Developer program. This guide provides information about the target audience for the certification program, recommended training and documentation, and a complete list of exam objectives—all with the intent of helping you achieve a passing score. Salesforce highly recommends a combination of on-the-job experience, course attendance, and self-study to maximize your chances of passing the exam.

## Section 2. About the Salesforce Certified Force.com Advanced Developer Program

The Salesforce Certified Force.com Advanced Developer program is designed for individuals who would like to demonstrate their knowledge and skills in building custom applications on the Force.com platform. The program encompasses the breadth of application development on the Force.com platform, including the declarative capabilities, the programmatic capabilities of Apex and Visualforce pages (Visualforce), and application development lifecycle management with cloud computing development as a service.

The Salesforce Certified Force.com Developer credential is a prerequisite for the program.

The Salesforce Certified Force.com Advanced Developer program has three components: (1) multiple-choice exam, (2) programming assignment, and (3) essay exam. To earn this credential, a candidate must successfully complete all three components.

1. **The Salesforce Certified Force.com Advanced Developer exam:** A multiple-choice/multiple-select proctored exam. This portion of the credential **must** be passed successfully to move on to the next portion, the programming assignment.
2. **The Advanced Developer programming assignment:** At scheduled times throughout the year, certification candidates who have passed the Salesforce Certified Force.com Advanced Developer exam will be given the opportunity to complete the second portion of the credential program: the programming assignment. A set of requirements and development parameters will be sent to the candidate, and the candidate will have a fixed amount of time to complete and submit the assignment. The candidate will be given the evaluation criteria and detailed instructions on how to complete and submit the final working application. The programming assignment is completed at the candidate's own pace and doesn't require working at a proctored site. However, there will be a deadline for assignment completion.
3. **The Advanced Developer essay exam:** Upon submission of the programming assignment, the candidate will be required to complete a short-answer proctored exam that covers the specifics of the programming assignment. The essay exam, in combination with the programming assignment, will be evaluated and scored as the final portion of the Salesforce Certified Force.com Advanced Developer certification program.

The Salesforce Certified Force.com Advanced Developer credential will be granted to a candidate upon successful completion of all three parts of the program.

## Section 3. Audience Description: Salesforce Certified Force.com Advanced Developer

The Salesforce Certified Force.com Advanced Developer program is intended for an individual who has experience developing custom applications on the Force.com platform, including practical application of the skills and concepts noted in the exam objectives below. The candidate has successfully completed the Salesforce Certified Force.com Developer exam and Apex and Visualforce Controllers course (DEV 501) from Salesforce or an Authorized Training Center or possesses equivalent experience and knowledge. The Salesforce Certified Force.com Advanced Developer candidate has the experience, skills and knowledge outlined below:

- Has experience with the Salesforce user interface (UI) and data model.

- Is competent developing Apex code that will scale to large data sets and custom interfaces using Visualforce and can develop code within the Salesforce interface or the Force.com IDE as required.
- Can deploy secure production-ready applications, has a broad understanding of the Force.com development lifecycle), can develop for the Force.com platform within an organization-specific development environment, and understands all deployment tools and knows when to apply each tool.
- Is capable of using Force.com capabilities as described in the exam objectives and identifying appropriate solutions to specific business challenges/process requirements by applying his/her knowledge of core programmatic features of the Force.com platform.
- Can design a test strategy that will ensure adequate quality (e.g., code coverage; application behaviors; scalability; environment independence) across Apex classes, triggers, and controllers.
- Has invested time in studying the resources listed in this Study Guide and the additional required study materials provided by Salesforce.

A candidate for this exam is not expected to be able to administer any standard Salesforce applications, develop integrations using the Force.com SOAP and REST APIs, or publish or consume Force.com App Exchange packages.

## Section 4. About the Exam

**The Salesforce Certified Force.com Advanced Developer multiple-choice** exam has the following characteristics:

- Content: 69 multiple-choice/multiple-select questions
- Time allotted to complete the exam: 120 minutes
- Passing score: 73 percent
- Registration fee: 400 USD; Retake fee: 200 USD
- Delivery options: Proctored exam delivered onsite at a testing center or in an online proctored environment
- References: No hard-copy or online materials may be referenced during the exam
- Prerequisites: Successful completion of the Salesforce Certified Force.com Developer exam; course attendance highly recommended
- Results: Provided immediately after exam submission as on-screen text and by email

**The Salesforce Certified Force.com Advanced Developer programming assignment** has the following characteristics:

- Prerequisite: Certified Force.com Advanced Developer multiple-choice exam and Salesforce Certified Force.com Developer release exams
- Format: Development of the programmatic components of an application using Apex and Visualforce to meet a defined set of business requirements in a pre-configured Salesforce organization. Dependent upon completion of the related essay exam (see step 3).
- Time allotted to complete the assignment: 1 month; you should plan to spend a minimum of 20 hours within the allotted window to complete the assignment.

- Delivery schedule: Offered periodically based on the schedule available at <http://certification.Salesforce/schedules#completing-programming-assignment>. Eligible candidates are notified via email when registration is available.
- Results: Provided by email, 6-8 weeks following exam submission, in combination with essay exam results.

**The Salesforce Certified Force.com Advanced Developer essay exam has the following characteristics:**

- When registering for the programming assignment you will schedule your essay exam
- Format: 3-5 short-answer essay questions related to the submitted programming assignment. Dependent upon completion of the programming assignment.
- Time allotted to complete the exam: 60 minutes
- Delivery options: Proctored exam delivered onsite at a testing center or in an online proctored environment
- References: No hard-copy or online materials may be referenced during the exam
- Results: Provided by email, 6-8 weeks following exam submission, in combination with programming assignment results.

## Section 5. Recommended Training and References

As preparation for this exam, Salesforce Training and Certification recommends a combination of: hands-on experience building custom applications on the Force.com platform using the declarative and programmatic capabilities of Apex and Visualforce pages; training course completion; and self-study in the areas listed in the Exam Outline section of this study guide.

Salesforce Training and Certification recommends the following instructor-led courses, online courses, and other resources to guide your study:

- Instructor-led course: Apex and Visualforce Controllers (DEV 501)
- Online resource: *Force.com Cookbook*
- Online course: Apex
- Online course: Visualforce Controllers
- Workbook: [Force.com Workbook](#)
- Workbook: [Apex Workbook](#)
- Workbook: [Visualforce Workbook](#)
- Development Lifecycle Guide: [Enterprise Development on the Force.com Platform](#)
- Documentation: *Force.com Apex Code Developer's Guide*, *Visualforce Developer's Guide*, *Force.com Metadata API Developer's Guide*, and *Force.com Migration Tool Guide*—available on [developer.force.com](http://developer.force.com)
- Trailhead: <https://developer.salesforce.com/trailhead>
- Become a member of [developer.force.com](http://developer.force.com)
- Create a Developer Edition account

Enroll in instructor-led courses and launch online training from your Salesforce application by clicking the **Help & Training** link in the upper right corner of the screen (requires login) and searching for the desired

courses, listed above. Non-Salesforce customers can register for instructor-led courses here: <http://www.Salesforce/training>.

In addition, Salesforce Training and Certification recommends reviewing online Documentation, Tip Sheets and User Guides by searching for the topics listed in the Exam Outline section of the study guide and studying the information related to those topics. Documentation, Tip Sheets and User Guides can also be accessed through **Help & Training**. Documentation is also available in PDF format here: <https://na1.Salesforce/help/doc/en/sf.pdf>.

## Section 6. Exam Outline

The Salesforce Certified Force.com Advanced Developer exam measures a candidate's knowledge and skills related to the objectives listed below. A candidate should have hands-on experience developing custom applications on the Force.com platform and have demonstrated the application of each of the features/functions below.

Objective	Weighting
<b>Development Lifecycle</b>	<b>13%</b>
List and describe the key features, tools, and technologies of application lifecycle management and Force.com development	
Describe best practices for managing multi-team and multi-project development initiatives with Force.com and describe how to use these best practices	
List and describe the various development and test environments available on the Force.com platform	
Describe how to manage sandbox environments	
Given a scenario, determine whether to use package or metadata deployment	
Describe how to use the Force.com migration tool	
Describe the capabilities and constraints of metadata text files for manipulating application metadata	
Describe the requirements and processes for deploying changes to an application using a metadata tool	
<b>Apex</b>	<b>33%</b>
List and describe the features of Apex and distinguish between it and other programming languages	
Describe when and why to use Apex	
List and describe syntax features of Apex	
Describe the ways Apex can be invoked	
Describe use cases for Apex in an integration scenario	
Describe how to send and receive email via Apex	
Describe use cases for dynamic Apex	
Describe use cases for batch Apex	
Describe the save execution order and use of before and after triggers	
Describe the types of governor limits and contexts and the rationale behind them	
Describe how to write scalable code that handles bulk operations	
<b>Visualforce</b>	<b>38%</b>
Describe the benefits, functions, and features of Visualforce pages and how it conforms to the model-view-controller pattern	
Describe how to incorporate Visualforce pages into Force.com applications	
Describe how to create data, action, and component binding expressions	
List and describe syntax features of Visualforce pages	
Describe best practices for incorporating static resources, style sheets, and other content into	

Force.com pages	
Describe how to create and use a Force.com page as the template for multiple pages	
Describe how to handle client-side behavior through the use of either standard components or custom JavaScript	
Describe and incorporate proper error-handling techniques	
Describe how to create a custom component and the benefits of custom components versus other techniques for code reuse	
Describe how to leverage PDF generation	
Distinguish between standard controllers, custom controllers, and extensions	
Describe the request lifecycle of a Force.com page	
Describe viewstate and the stateful programming model of Visualforce pages	
Describe the benefits of using Apex classes as structs or wrappers of sObjects	
<b>Testing and Debugging</b>	<b>16%</b>
Describe the techniques and tools available to debug, test, and monitor Apex execution	
List and describe the contents and use of the System Log	
Describe how to create and run unit tests as well as techniques for achieving 100% test coverage	
Describe how to test Force.com page controllers	
Describe how to test email send and receive in different environments	

## Section 7. Sample Exam Questions

The following questions are representative of those on the Salesforce Certified Force.com Advanced Developer exam. These questions are *not* designed to test your readiness to successfully complete the certification exam, but should be used to become familiar with the types of questions on the exam. The actual exam questions may be more or less difficult than this set of questions.

- A customer wants to add a custom validation process to the contact save process. Before a contact is created, the customer wants to include validation, which checks if the associated account is active. This validation should be active for all UI as well as integration requests. Which design accomplishes this goal?

  - A custom Web service
  - A before insert trigger
  - A custom Visualforce controller
  - A client-side S-control
- How could the use of Lists, Sets, or Maps help avoid governor limit exceptions in the following code? (Choose *two* answers.)

```
for (Account a : trigger.new) {
    for (Contact c : [select id,otherphone from contact where accountid = :a.id]) {
        c.OtherPhone= a.Phone;
        update c;
    }
}
```

  - Reduce the number of SOQL queries executed.
  - Reduce the total number of records retrieved by SOQL queries.
  - Reduce the number of DML statements.
  - Reduce the number of records processed as a result of DML statements.

3. Given the following Visualforce markup and assuming the controller and each extension include an action method named “go,” which class method will be invoked when the user clicks on the commandButton?

```
1 <apex:page controller="theController" extensions="ext1, ext2, ext3">
2   <apex:form>
3     <apex:commandButton value="Go" action="{!go}" re-render="out"/>
4     <apex:outputPanel id="out">{!output}</apex:outputPanel>
5   </apex:form>
6 </apex:page>
```

- A. theController  
B. ext1  
C. ext2  
D. ext3
4. Which statement is *true* about automated testing of custom controllers for Visualforce pages?
- A. Unlike other Apex tests, Visualforce tests must be executed in the browser.  
B. Calling Test.startTest() after setting a page fixture invokes a controller action specified in the page’s action attribute.  
C. Form submission in a Visualforce using a custom controller can be simulated in a Apex test class.  
D. Expected navigation can only be asserted in an Apex test when the resulting page is a Visualforce.
5. A Visualforce page has a command button that directly calls the doSomething() method shown below, where the MyCustomException is a class that extends the System.Exception class.

```
public void doSomething() {
    throw new MyCustomException('An error message. ');
}
```

Where would the exception be displayed to the user?

- A. In a <apex:messages> component, provided one is included on the page.  
B. Unhandled exceptions are only recorded in the debug log.  
C. At the top of the Visualforce page.  
D. On a separate page displaying the exception.



## Section 8. Answers to Sample Exam Questions

1. B
2. A, C
3. B
4. C
5. D

## Section 9. Maintaining a Certification

Successful completion of online, release-specific Salesforce Certified Force.com Developer exams is required to maintain the pre-requisite to the Salesforce Certified Force.com Advanced Developer credential. Release exams are published three times a year for each of the Salesforce product releases throughout the year.

Successful maintenance of the pre-requisite credential, Salesforce Certified Force.com Developer, is required to maintain this credential. An annual maintenance fee of \$100 will be charged when registering for every third release exam, based on when the pre-requisite credential was earned. The maintenance fee includes the three release exams and access to the supporting training material. Salesforce Certified professionals will be notified automatically when new release training material and exams become available.