

# CSDA Practice Exam Website

[www.cdsaprep.com](http://www.cdsaprep.com)

Elaboration1 Document

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3/26/2012	1.2		Minor edits

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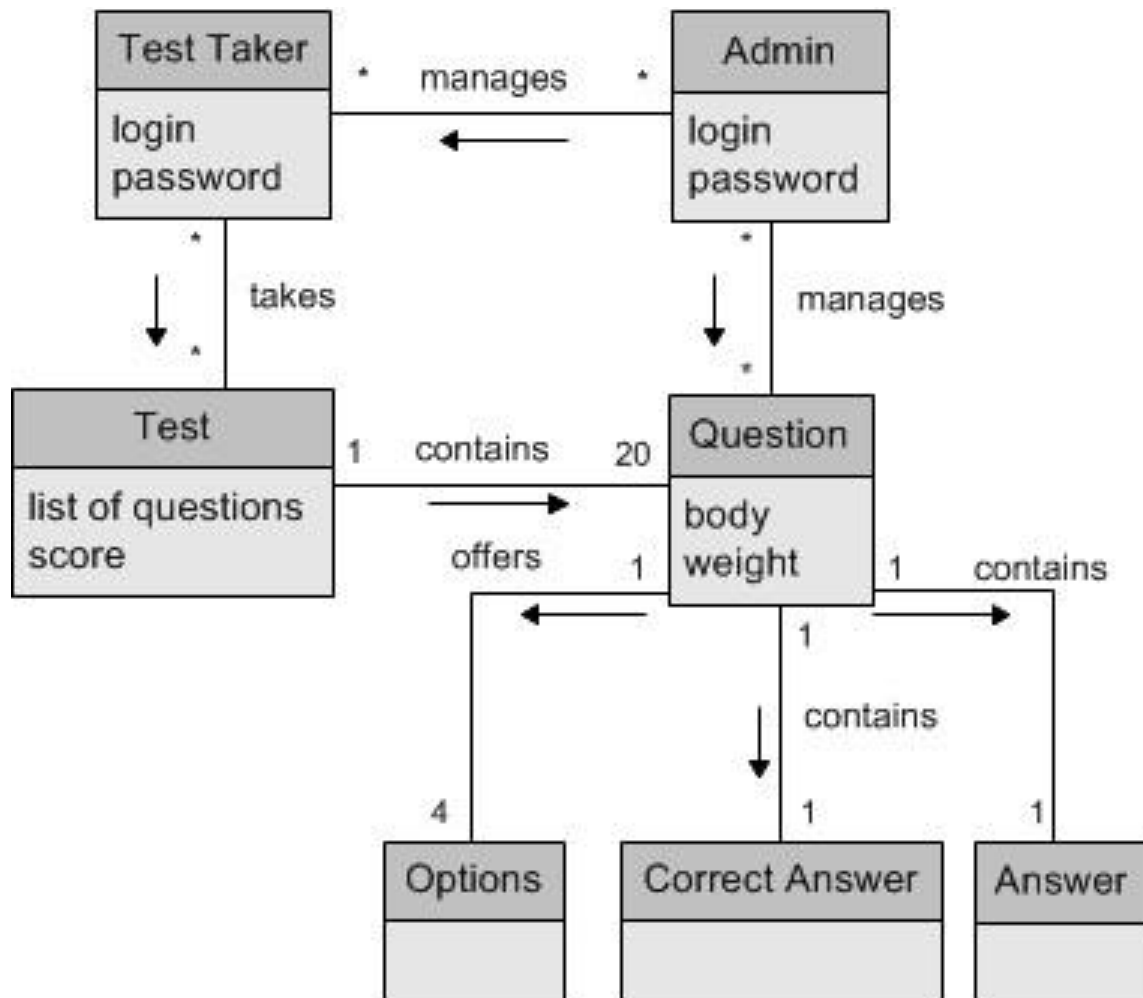
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## 1. Introduction

This document provides an overview of Elaboration 1 of our project, which is a web-based practice test system based on the Institute of Electrical and Electronics Engineers (IEEE) CSDA Exam. The Certified Software Development Associate (CSDA) credential is intended for graduating software engineers and entry-level software professionals, and it serves to bridge the gap between educational experience and real-world work requirements. The concepts and knowledge areas of the examination were derived from a job analysis study, and cover knowledge areas contained within the Software Engineering Body of Knowledge (SWEBOK).

## 2. Domain Model

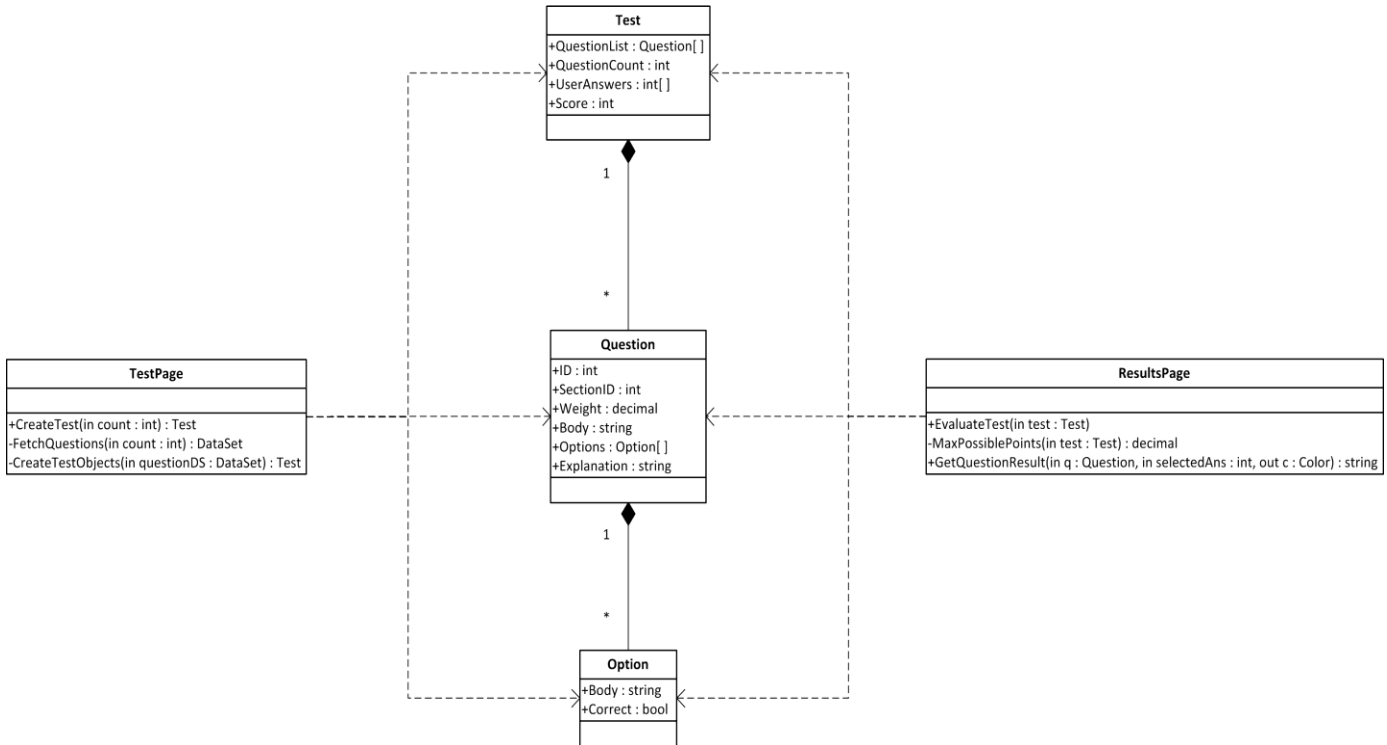
The domain model for the CSDA Practice Examination Website is as shown below:



### 3. Design Model

#### 3.1 Design Class Diagram

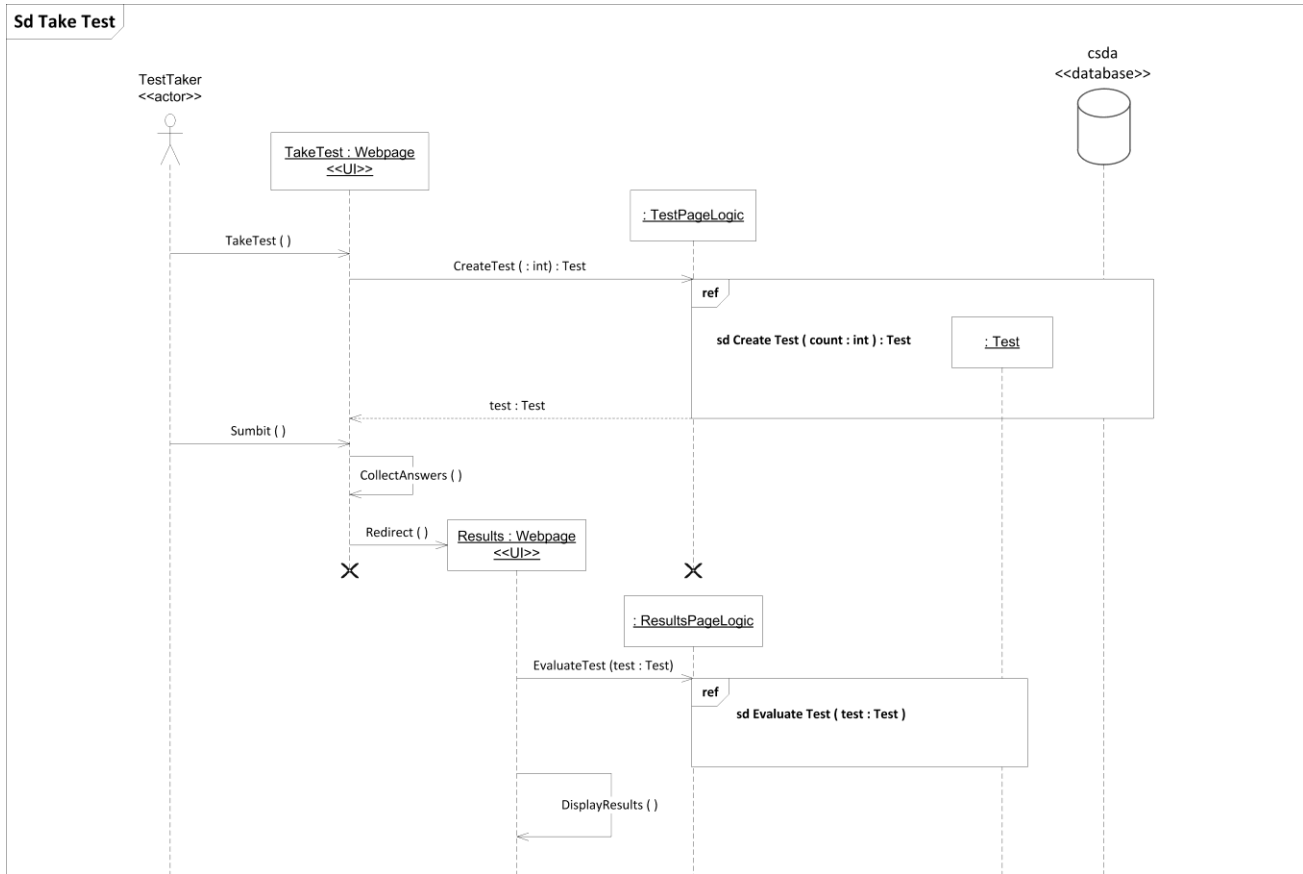
The design model for this project is as shown below:



## 4. Sequence Diagrams

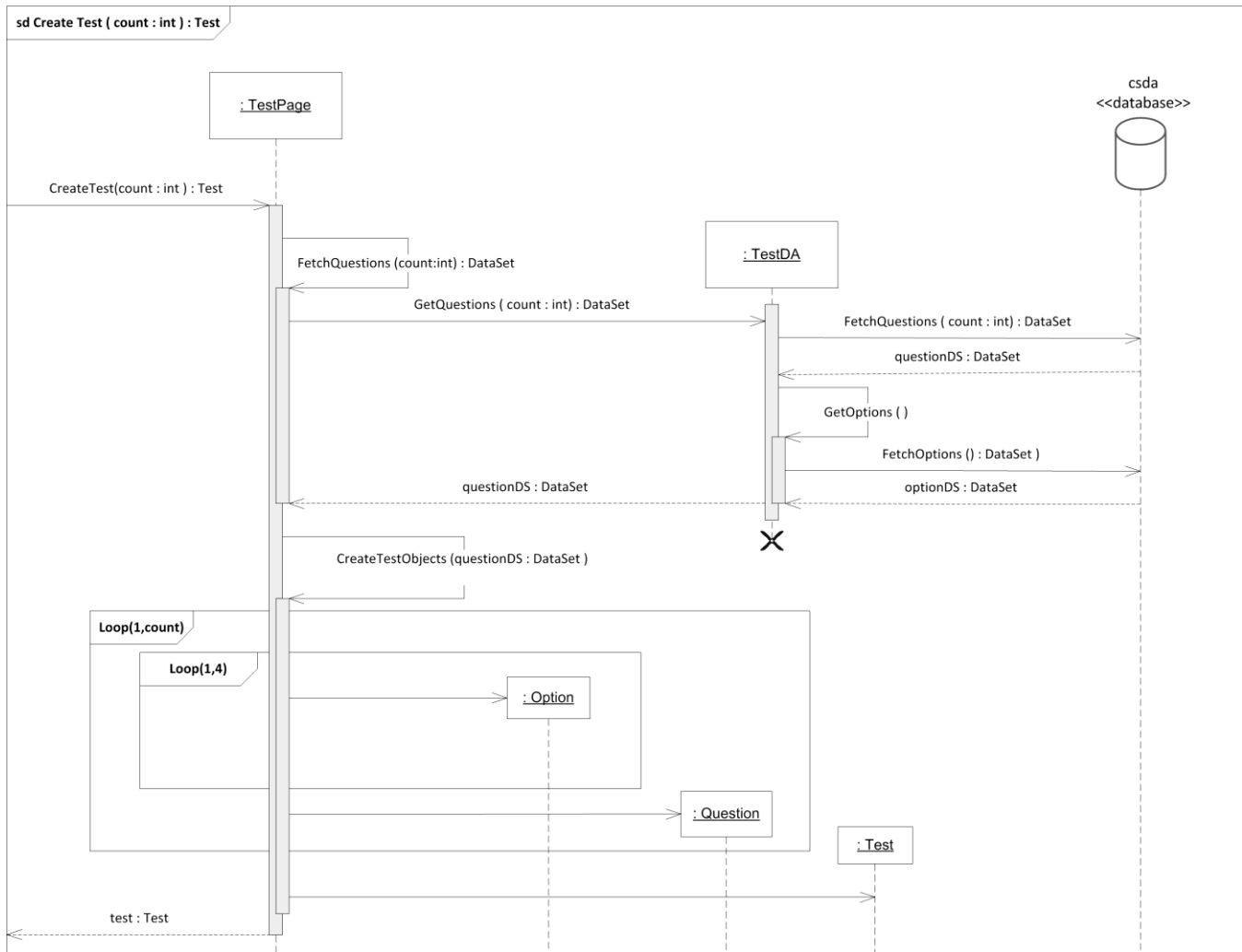
### 4.1.1 Overall View of Take Test Scenario

The sequence diagram of Take Test scenario is as follows:



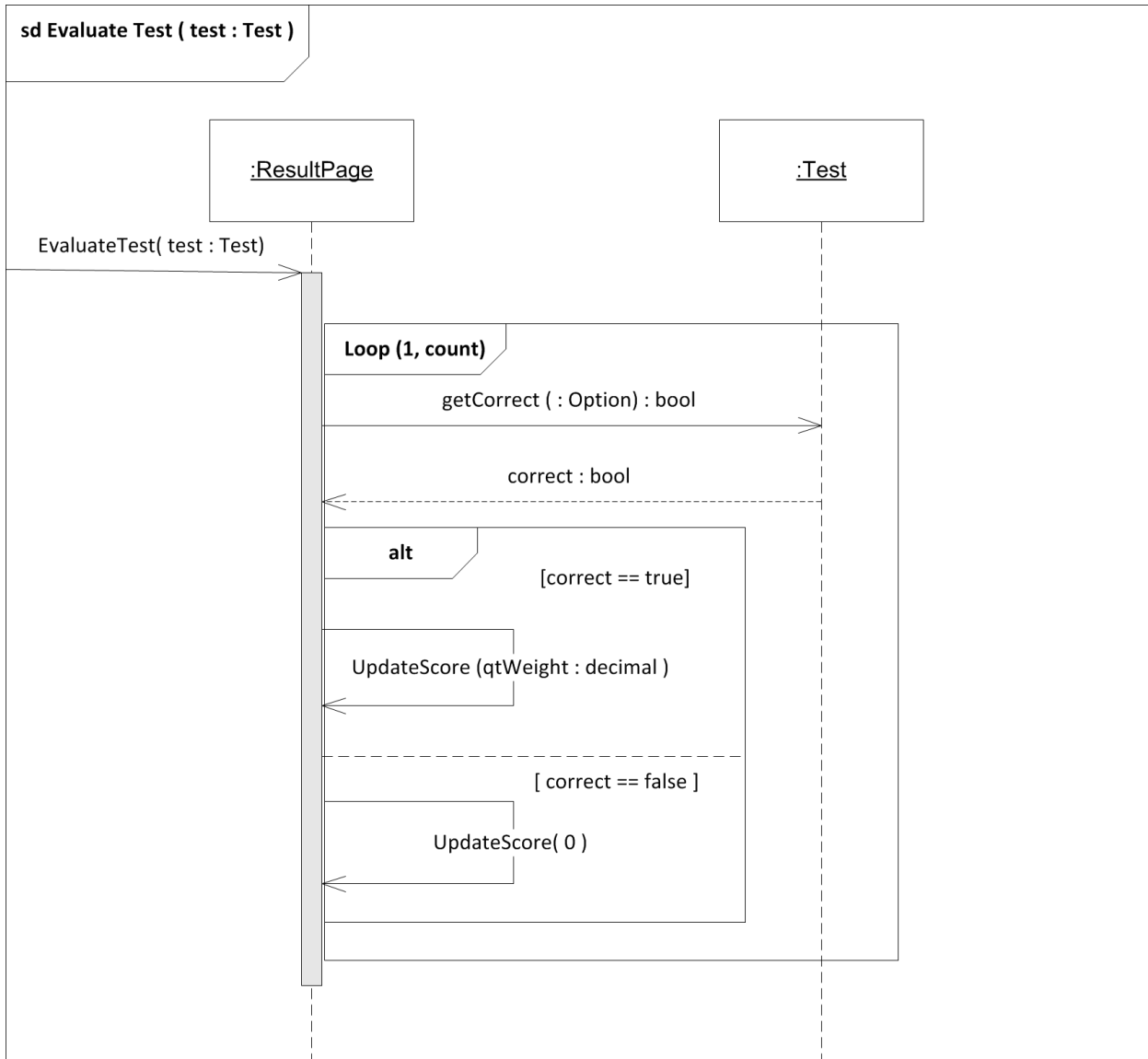
### 4.1.2 Create Test Scenario Referenced in Take Test

The sequence diagram to create a new test when the test taker clicks “take test” is as follows:



### 4.1.3 Evaluate Test Scenario Referenced in Take Test

The sequence diagram to evaluate a test, when the test taker clicks “submit” button, is as follows:

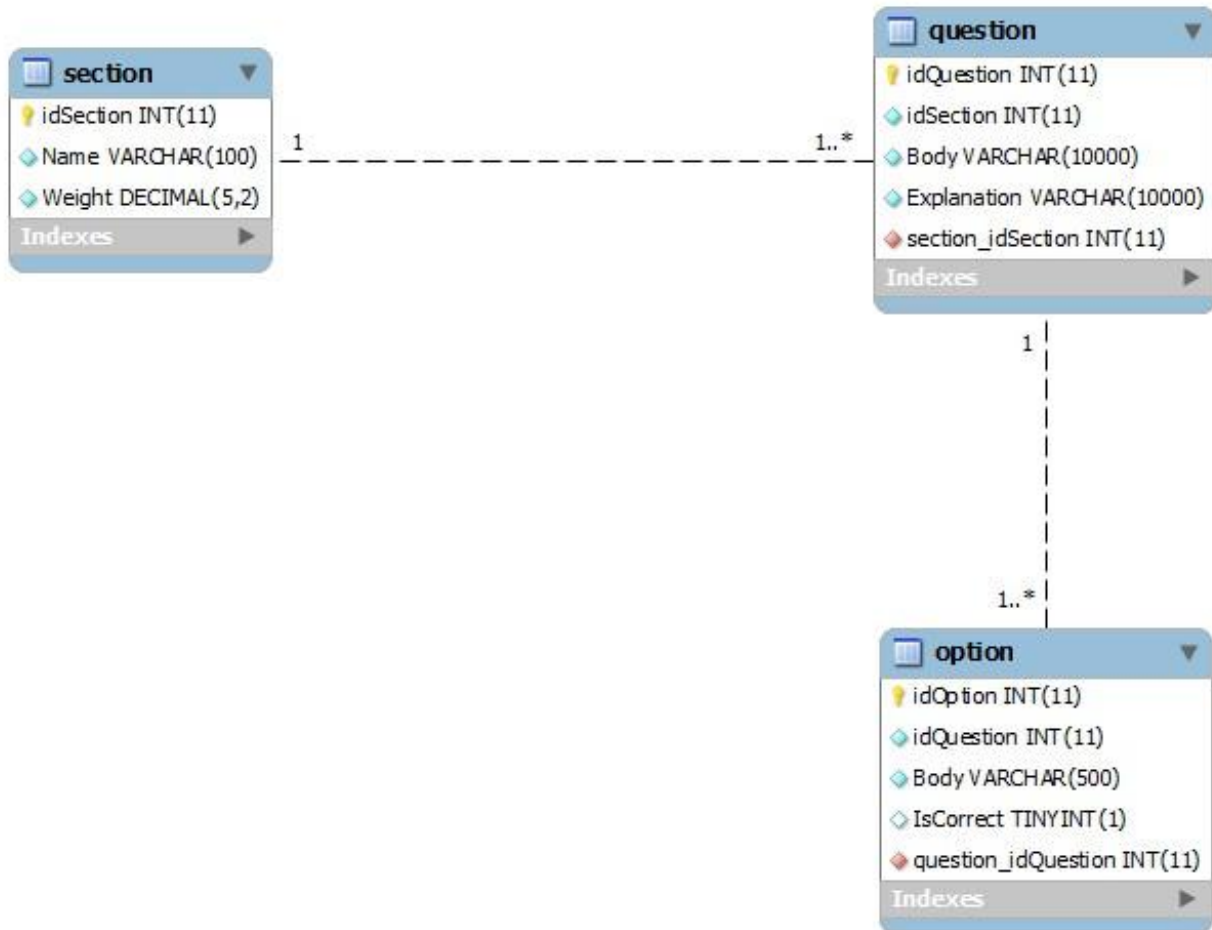




## 5. Data Model

### 5.1 Entity-Relationship Diagram

The E-R diagram for the Test module is as shown:



## 6. Test Model

Black box testing will be used to test the overall correctness of the application. In this test a user will follow a series of steps that will each test a different aspect of the application. The user will execute the following steps:

1. User visits URL
2. User enters invalid username/password combination
  - a. User should be redirected to Login page with error message indicating that username/password combination was invalid
3. User enters valid username/password combination
  - a. User should be directed to Test page with 20 questions displayed
4. User clicks "Reset Test"
  - a. A new test with different questions should be served
5. User answers some, but not all, questions
  - a. Client-side validation should not allow the Test to be evaluated, and should return a view with unanswered questions noted
6. User answers all questions and clicks "Submit"
  - a. Client-side validation should allow the Test to be evaluated, and a Results page that includes a score, as well as correct answer and explanation, should be returned to the user
7. User clicks "Logout"
  - a. User should be directed to Login page

## 7. Use-Case Storyboards and UI Prototypes

### 7.1 Use Cases

Elaboration 1 consists primarily of Use Case 2 (UC2: Take Test), as specified below. This represents the heart of the system, which allows a test taker to complete the test and then view feedback in the form of a score and details on which questions he marked correctly and incorrectly, as well as an explanation of the correct answer.

Elaboration 1 also includes UC2: Login, as this coding is manageable in the timeframe given, and the functionality will also be needed for UC3 and UC4, which will be included in Elaboration 2.

#### Use Case UC1: Login

<b>Use Case</b>	UC1: Login
<b>Description</b>	User logs into system and is presented with appropriate workspace
<b>Primary Actor</b>	Admin and test taker
<b>Precondition</b>	None
<b>Post condition</b>	User is logged into the system
<b>Main Success Scenario</b>	<ol style="list-style-type: none"><li>1. User visits URL</li><li>2. User enters valid login and password credentials</li><li>3. User is presented with appropriate workspace (test for test takers)</li></ol>
<b>Alternative Flow</b>	<ol style="list-style-type: none"><li>2a. User enters invalid login and password credentials<ol style="list-style-type: none"><li>1. System displays login page with error message indicating incorrect login/password, try again</li></ol></li></ol>

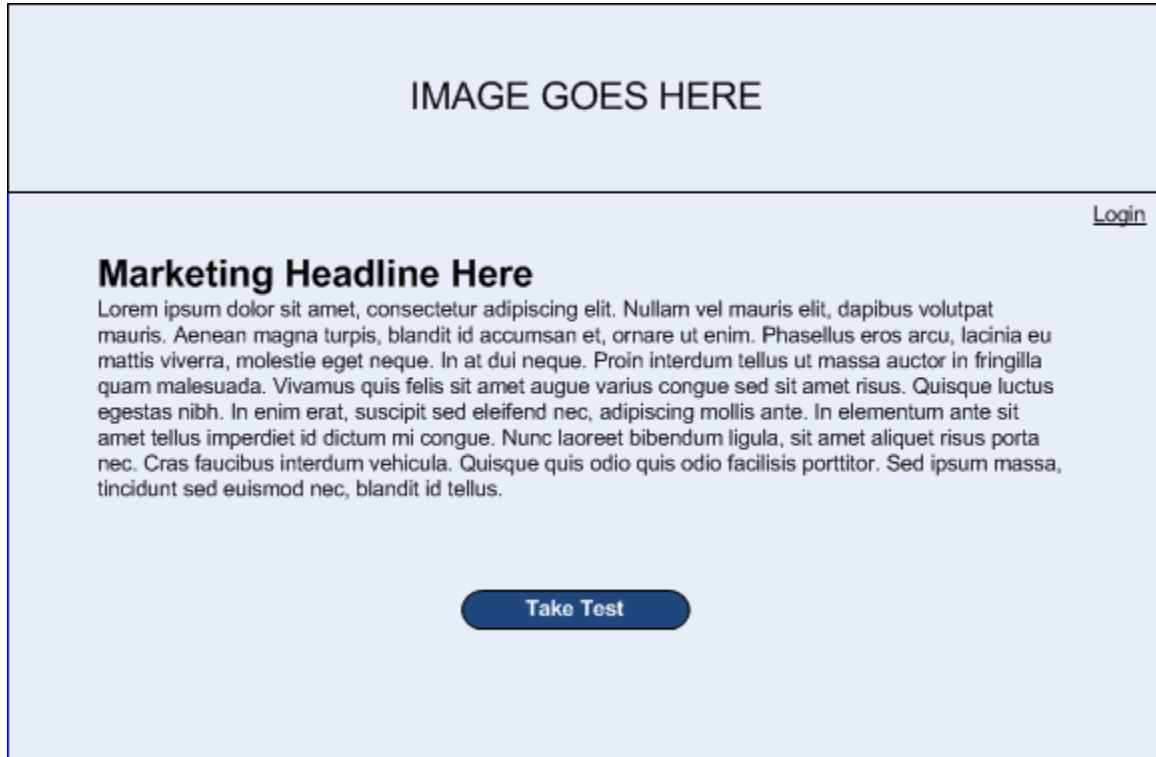
#### Use Case UC2: Take Test

<b>Use Case</b>	UC2: Take Test
<b>Description</b>	Test taker logged into the system takes test
<b>Primary Actor</b>	Test taker
<b>Precondition</b>	Test taker must be logged into the system
<b>Post condition</b>	Test taker completes test. Results are displayed.
<b>Main Success Scenario</b>	<ol style="list-style-type: none"><li>1. System shows test taker a new test with 20 questions</li><li>2. Test taker answers all 20 questions and submits the completed test for evaluation</li><li>3. System returns evaluated test with score and details on incorrectly answered questions</li><li>4. Test taker logs out</li></ol>
<b>Alternative Flow</b>	<ol style="list-style-type: none"><li>2a. Test taker resets test<ol style="list-style-type: none"><li>1. System reloads test with new questions</li></ol></li><li>2b. Test taker submits incomplete test<ol style="list-style-type: none"><li>1. System's client-side validation returns error message indicating that all questions must be answered</li><li>2. Test taker answers questions and resubmits</li></ol></li></ol>

## 7.2 Use Case Storyboards

### 7.2.1 Homepage

This page will be displayed when a user first visits the site:



## 7.2.2 Login Page

This page will be displayed when a user first visits the site, or logs out.

# IMAGE GOES HERE

[Login](#)

**Log In**  
Please enter your username and password. Register if you don't have an account.

Account Information

**Username:**

**Password:**

Keep me logged in

### 7.2.3 Test Page

After a Test Taker logs in, he will be presented with a Test Page that consists of 20 questions.

IMAGE GOES HERE

All 20 questions must be answered to complete the test. Once completed, click "Submit" at the bottom of the page to get your score.

[LOGOUT](#)  
[RESET TEST](#)

**Question 1**  
This is the text for question 1. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

- Answer option 1.a
- Answer option 1.b
- Answer option 1.c
- Answer option 1.d

**Question 2**  
This is the text for question 2. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

- Answer option 2.a
- Answer option 2.b
- Answer option 2.c
- Answer option 2.d

●  
● (questions continue)  
●  
●

**Question 19**  
This is the text for question 19. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

- Answer option 19.a
- Answer option 19.b
- Answer option 19.c
- Answer option 19.d

**Question 20**  
This is the text for question 20. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

- Answer option 20.a
- Answer option 20.b
- Answer option 20.c
- Answer option 20.d

[SUBMIT](#)

## 7.2.4 Test Page with Validation

Client-side validation ensures that the Test Taker answers all questions.

Will display if all questions are not answered and "submit" is clicked

IMAGE GOES HERE

All 20 questions must be answered to complete the test. Once completed, click "Submit" at the bottom of the page to get your score.

**LOGOUT**

**RESET TEST**

**All questions must be answered. Please see below.**

**Question 1**  
This is the text for question 1. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

Answer option 1.a

Answer option 1.b

Answer option 1.c

Answer option 1.d

**Question 2** **Please select an answer for this question.**  
This is the text for question 2. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

Answer option 2.a

Answer option 2.b

Answer option 2.c

Answer option 2.d

●  
● (questions continue)  
●

**Question 19**  
This is the text for question 19. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

Answer option 19.a

Answer option 19.b

Answer option 19.c

Answer option 19.d

**Question 20**  
This is the text for question 20. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

Answer option 20.a

Answer option 20.b

Answer option 20.c

Answer option 20.d

**SUBMIT**

Will display only on questions in which an answer was not selected

## 7.2.5 Evaluated Page

Once a Test Taker submits his Test, he will be presented a Score and told which questions were answered correctly and incorrectly. An explanation for each answer is also provided.

Will display "Correct! You answered X" with X showing the correct option if answered correctly.

If the incorrect option is selected, a message of "Incorrect. You answered Y. The correct answer is Z." will be displayed with Y representing the user's selected option and Z representing the correct option.

### IMAGE GOES HERE

[LOGOUT](#)

[RESET TEST](#)

Your score is computed using a weighted average determined by section weights within the Software Engineering Body of Knowledge (SWEBOK).

Your weighted score is: **XX.X%**

**Question 1 Incorrect. You answered a. The correct answer is b.**

This is the text for question 1. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

**Explanation**  
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

**References**  
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Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

**Question 2 Correct! You answered b.**

This is the text for question 2. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

**Explanation**  
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

**References**  
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●  
● (questions continue)  
●

**Question 19 Incorrect. You answered b. The correct answer is a.**

This is the text for question 19. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

**Explanation**  
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**References**  
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Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

**Question 20 Correct! You answered a.**

This is the text for question 20. It can be any question from the data base. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

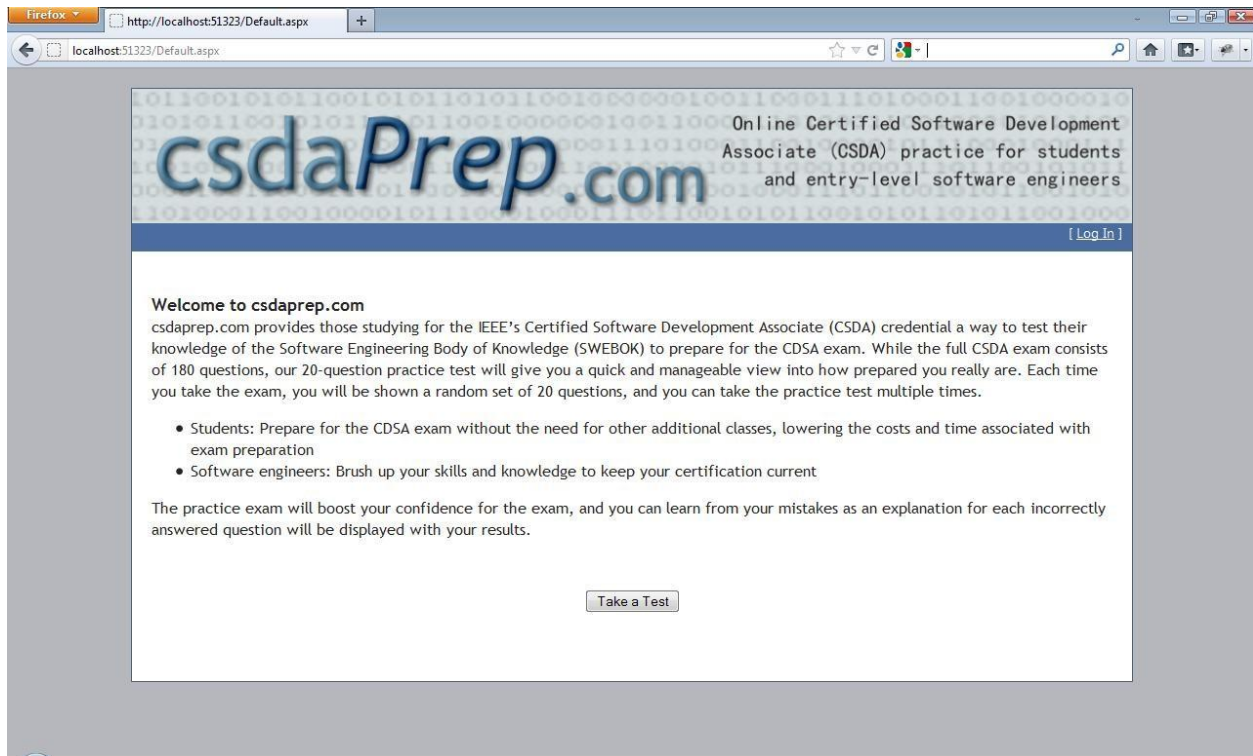
**Explanation**  
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam vel mauris elit, dapibus volutpat mauris. Aenean magna turpis, blandit id accumsan et, ornare ut enim.

**References**  
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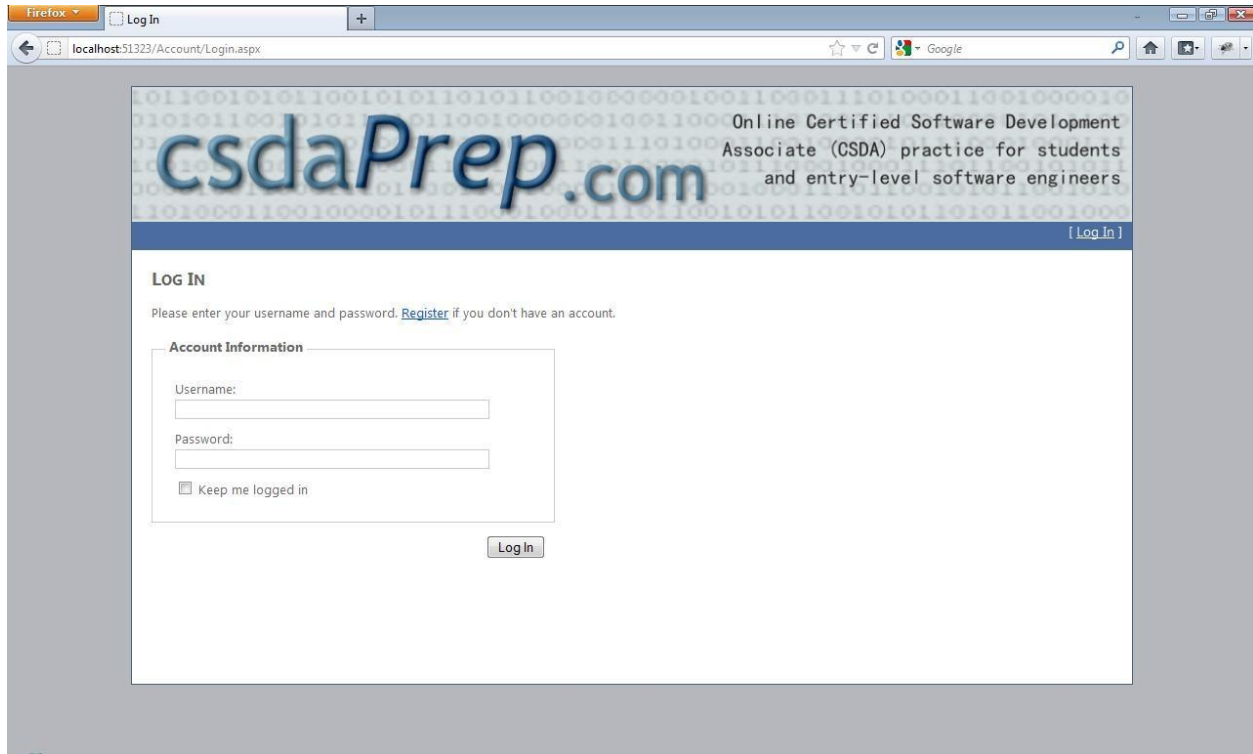
## 8. User Interface

When the users visit the website [www.csdaprep.com](http://www.csdaprep.com), they are presented with the home screen shown below:



## 8.1 Login

To take the test, users need to login to the system.



The screenshot shows a web browser window with the address bar displaying "localhost:51323/Account/Login.aspx". The page header features the "csdaPrep.com" logo in a large, blue, stylized font. To the right of the logo, the text reads "Online Certified Software Development Associate (CSDA) practice for students and entry-level software engineers". A "[Log In]" link is visible in the top right corner of the header.

The main content area is titled "LOG IN" and contains the following text: "Please enter your username and password. [Register](#) if you don't have an account."

Below this text is a form titled "Account Information" with the following fields and options:

- Username:
- Password:
- Keep me logged in

A "Log In" button is located at the bottom right of the form.

## 8.2 Take Test

csdaPrep.com Online Certified Software Development Associate (CSDA) practice for students and entry-level software engineers [Log In]

[Reset Test](#)

**ALL 20 QUESTIONS MUST BE ANSWERED TO COMPLETE THE TEST. ONCE COMPLETED, CLICK "SUBMIT" AT THE BOTTOM OF THE PAGE TO GET YOUR SCORE.**

**QUESTION 1**  
An organization has gathered and analyzed requirements from the stakeholders for a new project, "Video Editing Software for the Hobbyist." The organization has experience with developing software, but not with commercial off-the-shelf software titles. The development team consists of thirty people with varying levels of experience. During the requirements phase, the team noticed that the source of each requirement is documented by the name of the person who first presented the requirement and the date gathered.

Which missing pieces of information will have the GREATEST IMPACT on the analysis task required during change management?

- I. Traceability
- II. Requirement Type
- III. Priority
- IV. Source

I and II only  
 II and IV only  
 I and III only  
 III and IV only

---

**QUESTION 2**  
A software product is in its third release. The current test effort is totally manual. Senior test engineers are assigned to test the new functionality of a release, whereas junior testers are assigned the task of manually conducting the regression test cases.

Which of the following arguments does NOT support a case for automating the regression test cases?

- Automated testing increases the precision with which a test is repeated.
- Regression testing is more likely to be executed completely with each release of the software.
- Automated testing can take advantage of nonworking hours.
- Manual testing is typically less expensive than automated testing.

\*

\*

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**QUESTION 20**  
A design team is working on the design of a payroll system. The system is being revised to accommodate new features that the customer desires. Previous versions of the design were not well documented, and the team is taking advantage of the current version to document the new design.

Analysis of the previous design noted that functions were grouped into modules in a haphazard way. This design property is BEST described as:

- Coincidental cohesion
- Logical cohesion
- Content coupling
- Common coupling

## 8.3 Result

The result for the test is displayed after all questions are answered and submitted.

The screenshot shows a web browser window displaying the results of a test on the csdaPrep.com website. The page header includes the site logo and the text "Online Certified Software Development Associate (CSDA) practice for students and entry-level software engineers". A "Reset Test" link is visible in the top right. The main content area displays the user's weighted score as 22.7%. Below this, "QUESTION 1" is presented, describing a scenario about requirements for a video editing software project. The question asks which missing pieces of information will have the greatest impact on the analysis task. The user's answer, "I and II only", is marked as "INCORRECT". An "EXPLANATION" section follows, detailing the importance of priority, traceability, and requirement type. "Helpful References" are listed at the bottom of the question section. Two asterisks are placed between the question and the next one. "QUESTION 20" is then shown, describing a payroll system design scenario. The user's answer, "Coincidental cohesion", is marked as "CORRECT". An "EXPLANATION" section is also present for this question.

csdaPrep.com Online Certified Software Development Associate (CSDA) practice for students and entry-level software engineers [ Log In ]

Reset Test

Your score is computed using a weighted average determined by section weights within the Software Engineering Body of Knowledge (SWEBOOK).

**Your weighted score:**

22.7%

**QUESTION 1**  
An organization has gathered and analyzed requirements from the stakeholders for a new project, "Video Editing Software for the Hobbyist." The organization has experience with developing software, but not with commercial off-the-shelf software titles. The development team consists of thirty people with varying levels of experience. During the requirements phase, the team noticed that the source of each requirement is documented by the name of the person who first presented the requirement and the date gathered.

Which missing pieces of information will have the GREATEST IMPACT on the analysis task required during change management?

- I. Traceability
- II. Requirement Type
- III. Priority
- IV. Source

**YOUR ANSWER:**  
I and II only  
**INCORRECT**

**EXPLANATION**

Several pieces of information are used to evaluate a proposal to change a given requirement. The priority of the proposed change reflects the importance or criticality of the request. In most prioritization schemes, a priority 1 change identifies a safety or security hazard and takes precedence over all other changes, whereas a priority 4 or 5 change is "nice to have." Priority is a key piece of information needed to make the yes/no decision and allocate the requirement to a specific release or software version. In addition, the cost and schedule impact of the requested change is key information. Traceability information contributes to impact analysis; it is the key to identifying all affected components. Other information needed to evaluate a change request might include technical feasibility/risk or analysis of alignment with the project's objectives and resource constraints. It is unlikely that the requirement type alone will have a great impact, although business objectives might favor, for example, increased performance over enhanced functionality. The source of the requirement is not missing.

**Helpful References**

Wiegiers, K., Software Requirements, Microsoft Press, 1999.  
Sommerville, I, Software Engineering, 6th ed., Addison-Wesley, 2001.

\*  
\*

**QUESTION 20**  
A design team is working on the design of a payroll system. The system is being revised to accommodate new features that the customer desires. Previous versions of the design were not well documented, and the team is taking advantage of the current version to document the new design.

Analysis of the previous design noted that functions were grouped into modules in a haphazard way. This design property is BEST described as:

**YOUR ANSWER:**  
Coincidental cohesion  
**CORRECT**

**EXPLANATION**

## Glossary

CSDA	The Certified Software Development Associate (CSDA) credential is intended for graduating software engineers and entry-level software professionals, and it serves to bridge the gap between educational experience and real-world work requirements.
Exam	Exam refers to the 4-hour test administered by the IEEE at a test center.
IEEE	The Institute of Electrical and Electronics Engineers (IEEE, read I-Triple-E) is a non-profit professional association headquartered in New York City that is dedicated to advancing technological innovation and excellence. It has more than 400,000 members in more than 160 countries, about 55% of whom reside in the United States.
Question	A Question is a single item that contains a description, a problem and four possible answers, which the test taker must select. Each Question is also assigned a weighted value, depending on the value assigned for the section with which the Question deals.
Score	A score on a Test is based on a weighted average of correctly answered questions based on the weight assigned to the Section in which the question is derived. The formula for the score is calculated by adding the weights of all correctly answered questions and dividing it by the added weights of all questions. The answer is then multiplied by 100 to return a percentage.
Section	Sections and their weights are derived from sections within the SWEBOK, and their importance/weight within the CSDA exam administered by the IEEE. The sections and their weights are: <ul style="list-style-type: none"><li>• Software Requirements: 15</li><li>• Software Design: 23</li><li>• Software Construction: 11</li><li>• Software Testing: 16</li><li>• Software Maintenance: 4</li><li>• Software Configuration Management: 4</li><li>• Software Engineering Management: 11</li><li>• Software Engineering Process: 3</li><li>• Software Engineering Tools and Methods: 3</li><li>• Software Quality: 7</li><li>• Business Practices and Engineering Economics: 3</li></ul>

SWEBOK	<p>The Software Engineering Body of Knowledge (SWEBOK) documents the consensus on the structure of the relevant software engineering knowledge area. The purposes of the SWEBOK Guide are:</p> <ul style="list-style-type: none"> <li>• to characterize the contents of the software engineering discipline;</li> <li>• to promote a consistent view of software engineering worldwide;</li> <li>• to clarify the place of, and set the boundary of, software engineering with respect to other disciplines;</li> <li>• to provide a foundation for training materials and curriculum development;</li> <li>• and to provide a basis for certification and licensing of software engineers.</li> </ul>
Test	A Test is displayed to a test taker, and it is comprised of 20 practice questions. Once the test taker completes and submits a Test for evaluation, a weighted score is displayed and an explanation for each incorrectly answered question.
Test taker	A user type that wants to take the CSDA Practice Test.