

## Create Quiz Test Requirements

### Input Space Partitions

1. Input variables:
  - 5 input boxes: Name, length (in minutes, open date, due date, number of submissions(NOS) )
  - 2 buttons: Create questions, cancel
  - 3 browser features: back, forward, reload
2. Definition of characteristics of input variables:
  - char 1: name is empty or not
  - char 2: length and NOS are numbers or not
  - char 3: length and NOD compare to 0
  - char 4: open and due area dates
  - char 5: form button is clicked
  - char 6: browser feature clicked
3. Partitions:
  - char 1: [empty, not empty]
  - char 2: [number, not number]
  - char 3: [neg, 0, pos]
  - char 4: [date, not date]
  - char 5: [create questions, cancel]
  - char 6: [none, back, forward, reload]
4. Completeness and disjointness:
  - It is complete but not disjoint
5. Values:
  - char 1: [ "", "a" ]
  - char 2: [1,a]
  - char 3: [-1, 0, 1]
  - char 4: [11/14/2018 00:00, 12]
  - char 5: [create questions, cancel]
  - char 5: [none, back, forward, reload]
6. Test requirements that satisfies Base Choice coverage:
  - Base tr:
    - tr 1: ["a", 1, 1, 11/14/2018 00:00, create questions, none]
  - Base coverage:
    - tr 2: ["a", 1, 1, 11/14/2018 00:00, cancel, none]
    - tr 3: ["a", 1, 1, 12, create questions, none]
    - tr 4: ["a", 1, 0, 11/14/2018 00:00, create questions, none]
    - tr 5: ["a", 1, -1, 11/14/2018 00:00, create questions, none]
    - tr 6: ["a", a, 1, 11/14/2018 00:00, create questions, none]
    - tr 7: [ "", 1, 1, 11/14/2018 00:00, create questions, none]
    - tr 8: ["a", 1, 1, 11/14/2018 00:00, create questions, back]
    - tr 9: ["a", 1, 1, 11/14/2018 00:00, create questions, forward]
    - tr 10: ["a", 1, 1, 11/14/2018 00:00, create questions, reload]
  - Infeasible tests:
    - tr 4
    - tr 5
    - tr 6
  - Fix infeasible test:

tr 4: ["a", 0, 0, 11/14/2018 00:00, create questions]  
tr 5: ["a", -1, -1, 11/14/2018 00:00, create questions]  
tr 6: ["a", a, a, 11/14/2018 00:00, create questions]

#### 7. Test set:

tc 1: a, 1, 11/14/2018 00:00, 11/14/2018 00:00, 1, create questions, none (base)  
Expected output: next page (create questions)

tc 2: a, 1, 11/14/2018 00:00, 11/14/2018 00:00, 1, cancel, none  
Expected output: stay on current page (create quiz)

tc 3: a, 1, 12, 12, 1, create questions  
Expected output: error message ("enter valid date")

tc 4: a, 0, 11/14/2018 00:00, 11/14/2018 00:00, 0, create questions  
Expected output: unknown, perhaps invalid input message

tc 5: a, -1, 11/14/2018 00:00, 11/14/2018 00:00, -1, create questions  
Expected output: error message ("enter valid number")

tc 6: a, a, 11/14/2018 00:00, 11/14/2018 00:00, a, create questions  
Expected output: error message ("enter valid number")

tc 7: "", a, 11/14/2018 00:00, 11/14/2018 00:00, a, create questions  
Expected output: error message ("enter valid number")

tc 8: a, 1, 11/14/2018 00:00, 11/14/2018 00:00, 1, create questions, back  
Expected output: go from create question back to create quiz page, and quiz values are still displayed correctly

tc 9: a, 1, 11/14/2018 00:00, 11/14/2018 00:00, 1, create questions, forward  
Expected output: stay in create question page and quiz name doesn't disappear

tc 10: a, 1, 11/14/2018 00:00, 11/14/2018 00:00, 1, create questions, reload  
Expected output: stay in create question page and correct quiz name displays

#### 8. Additional tests

An additional test was created to make sure that the correct page shows up with the given url.

#### Test Results:

The base case and test case 2 pass. In other words if the input is valid then the page displays expected behavior.

Conversely, test cases 3, 4, 5, 6, and 7 fail because the page does not meet the requirements for invalid input (see fig. CQ1). In other words, if the input is invalid the page doesn't display expected behavior. Developers must be notified to update page behavior to pass tests.

To ensure tests are working properly, tests were changed temporally to accept actual output as expected result. After this change all tests passed (see fig. CQ2), so test harness is working properly, and problems lie on the page's code.

Fig. CQ1: Some tests failing because page doesn't meet requirements

The screenshot displays the IntelliJ IDEA IDE interface. The top pane shows the source code of `CreateQuiz_Test.java`. The code includes imports for JUnit and Selenium, a class comment for Cynthia Cabrera, and a `@Before` method. The bottom pane shows the test results for the `CreateQuiz_Test` class. The results indicate that 6 tests failed and 5 tests passed. The failed tests are `test_casi` (10, 15, 9, 11, 18, and 17 ms) and the passed tests are `test_Bas` (20 ms), `test_casi` (14 ms), `test_oper` (7 ms), `test_casi` (16 ms), and `test_case` (6 ms). The error messages for the failed tests are related to the `WebDriver` driver and the `createSession` method.

```
1 import org.junit.Before;
2
3 import static org.junit.Assert.assertEquals;
4 import static org.junit.Assert.*;
5
6 import org.junit.After;
7 import org.junit.Test;
8 import org.openqa.selenium.By;
9 import org.openqa.selenium.JavascriptExecutor;
10 import org.openqa.selenium.WebDriver;
11 import org.openqa.selenium.WebElement;
12
13 import org.openqa.selenium.firefox.FirefoxDriver; // for Firefox
14 import org.openqa.selenium.chrome.ChromeDriver; // for chrome
15 import org.openqa.selenium.interactions.Actions;
16 import org.openqa.selenium.support.ui.WebDriverWait;
17
18 import java.util.List;
19
20 /**
21  * Cynthia Cabrera
22  * Input space test for CreateQuiz
23  *
24  * Note:
25  * Test environment: Chrome Version 68, selenium 3.14.0, Java 8, ChromeDriver 2.42
26  */
27
28 public class CreateQuizTest
29 {
30     private WebDriver driver;
31     //private String login_url = "http://pegasus.cs.virginia.edu/quiztool";
32     private String url; // = "http://pegasus.cs.virginia.edu/quiztool/createQuiz/3/";
33
34     @Before
35     public void setUp()
36     {
37         // ...
38     }
39 }
```

Run: CreateQuiz\_Test x

Tests failed: 6, passed: 5 of 11 tests - 2 m 28 s 215 ms

- test\_Bas 20 s 871 ms
- test\_casi 14 s 930 ms
- test\_oper 7 s 739 ms
- test\_casi 10 s 251 ms
- test\_casi 15 s 104 ms
- test\_case 9 s 173 ms
- test\_casi 11 s 259 ms
- test\_casi 18 s 608 ms
- test\_casi 17 s 305 ms
- test\_casi 16 s 555 ms
- test\_case 6 s 420 ms

Starting ChromeDriver 2.41.578700 (2f1ed5f9343c13f73144538f15c00b370eda6706) on port 20581  
Only local connections are allowed.  
Dec 07, 2018 5:13:15 PM org.openqa.selenium.remote.ProtocolHandshake createSession  
INFO: Detected dialect: OSS

Starting ChromeDriver 2.41.578700 (2f1ed5f9343c13f73144538f15c00b370eda6706) on port 31595  
Only local connections are allowed.  
Dec 07, 2018 5:13:35 PM org.openqa.selenium.remote.ProtocolHandshake createSession  
INFO: Detected dialect: OSS

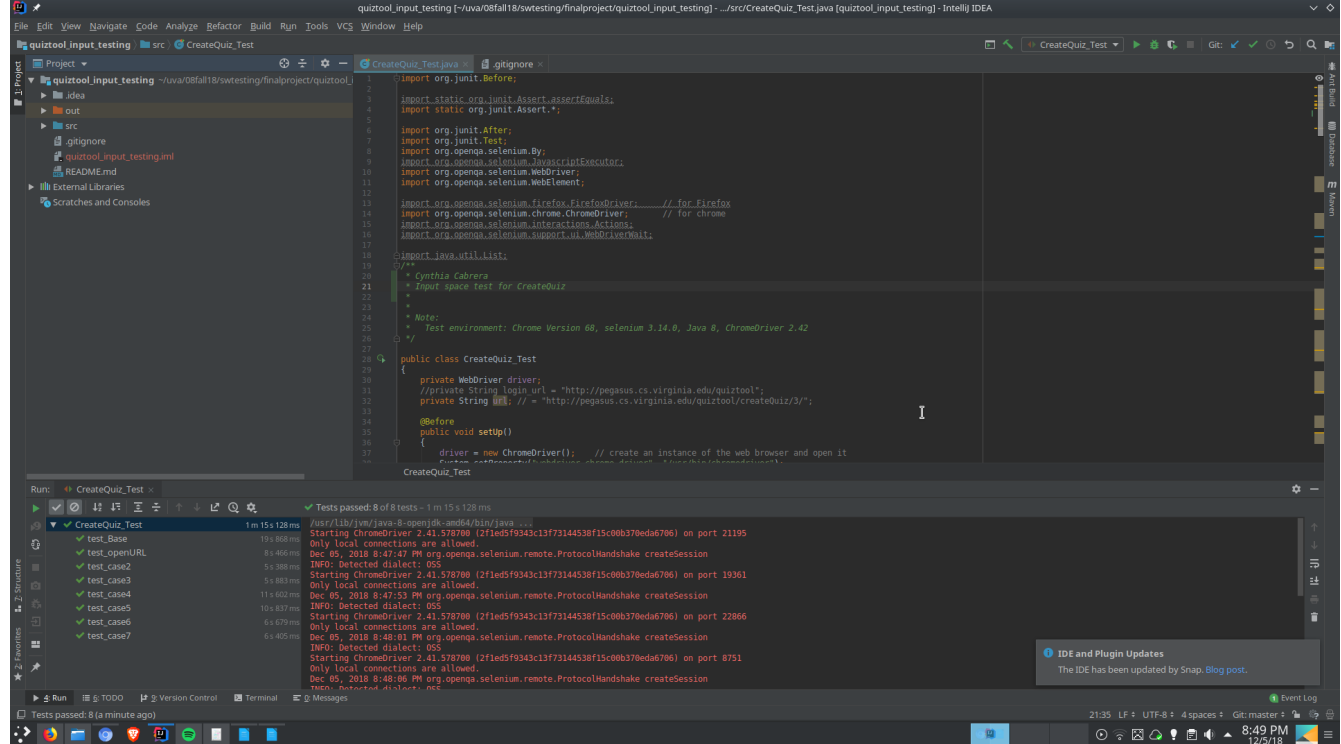
Starting ChromeDriver 2.41.578700 (2f1ed5f9343c13f73144538f15c00b370eda6706) on port 21586  
Only local connections are allowed.  
Dec 07, 2018 5:13:50 PM org.openqa.selenium.remote.ProtocolHandshake createSession  
INFO: Detected dialect: OSS

Starting ChromeDriver 2.41.578700 (2f1ed5f9343c13f73144538f15c00b370eda6706) on port 28182  
Only local connections are allowed.  
Dec 07, 2018 5:13:58 PM org.openqa.selenium.remote.ProtocolHandshake createSession  
INFO: Detected dialect: OSS

java.lang.AssertionError <3 internal calls>

Tests failed: 6, passed: 5 (moments ago)

Fig. CQ2: All test passing to ensure test harness is working properly



## Automated Tests on Selenium

```
import org.junit.Before;
import static org.junit.Assert.assertEquals;
import static org.junit.Assert.*;
import org.junit.After;
import org.junit.Test;
import org.openqa.selenium.By;
import org.openqa.selenium.JavascriptExecutor;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.WebElement;
import org.openqa.selenium.firefox.FirefoxDriver;    // for Firefox
import org.openqa.selenium.chrome.ChromeDriver;     // for chrome
import org.openqa.selenium.interactions.Actions;
import org.openqa.selenium.support.ui.WebDriverWait;
import java.util.List;
/**
 * Cynthia Cabrera
 * Input space test for CreateQuiz
 *
 *
 * Note:
 * Test environment: Chrome Version 68, selenium 3.14.0, Java 8, ChromeDriver 2.42
 */
public class CreateQuiz_Test
{
    private WebDriver driver;
    //private String login_url = "http://pegasus.cs.virginia.edu/quiztool";
    private String url; // = "http://pegasus.cs.virginia.edu/quiztool/createQuiz/3/";
    @Before
    public void setUp()
    {
        driver = new ChromeDriver();    // create an instance of the web browser and open
        it
        System.setProperty("webdriver.chrome.driver", "/usr/bin/chromedriver");
        //Login into quiztool app
        url = "http://pegasus.cs.virginia.edu/quiztool/login";
        driver.get(url);                // open the given url
        driver.findElement(By.name("username")).sendKeys("professorM");
        driver.findElement(By.name("password")).sendKeys("swtesting1");
        WebElement element =
        driver.findElement(By.xpath("/html/body/div/div/form/div/button[@type='submit']"));
        element.click();
        // Go to createQuiz
        url = "http://pegasus.cs.virginia.edu/quiztool/createQuiz/1/";
        driver.get(url);                // open the given url
    }
    @After
    public void teardown()
    {
        driver.quit();                  // close the browser
    }
    @Test
    public void test_openURL()
    {
        assertTrue(driver.getPageSource().contains("Create a Quiz")); // check if we are
        on the right page
    }
    @Test
    public void test_Base()            // test case #1
    {

```

```

        // Fill input fields
        driver.findElement(By.name("quiz_name")).clear();
        driver.findElement(By.name("quiz_name")).sendKeys("a");
        driver.findElement(By.name("duration")).clear();
        driver.findElement(By.name("duration")).sendKeys("1");
        driver.findElement(By.name("open_date")).clear();
        driver.findElement(By.name("open_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.name("due_date")).clear();
        driver.findElement(By.name("due_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the datepicker
        driver.findElement(By.name("number_of_allowed_submissions")).clear();
        driver.findElement(By.name("number_of_allowed_submissions")).sendKeys("1");
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit
        WebElement element =
driver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div/button[@type='submit']
[1]"));
        element.click();
        // Check result
        assertTrue(driver.getPageSource().contains("Question text"));
    }
    @Test
    public void test_case2()
    {
        // Fill input fields
        driver.findElement(By.name("quiz_name")).clear();
        driver.findElement(By.name("quiz_name")).sendKeys("a");
        driver.findElement(By.name("duration")).clear();
        driver.findElement(By.name("duration")).sendKeys("1");
        driver.findElement(By.name("open_date")).clear();
        driver.findElement(By.name("open_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.name("due_date")).clear();
        driver.findElement(By.name("due_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the datepicker
        driver.findElement(By.name("number_of_allowed_submissions")).clear();
        driver.findElement(By.name("number_of_allowed_submissions")).sendKeys("1");
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        driver.findElement(By.linkText("Cancel")).click();
        //element.click();
        //try { Thread.sleep(1000); } catch (InterruptedException e) { }// TODO Auto
        assertTrue(driver.getPageSource().contains("CS 4501"));
    }
    @Test
    public void test_case3()
    {
        // Fill input fields
        driver.findElement(By.name("quiz_name")).clear();
        driver.findElement(By.name("quiz_name")).sendKeys("a");
        driver.findElement(By.name("duration")).clear();
        driver.findElement(By.name("duration")).sendKeys("1");
        driver.findElement(By.name("open_date")).clear();
        driver.findElement(By.name("open_date")).sendKeys("12");
        driver.findElement(By.name("due_date")).clear();
        driver.findElement(By.name("due_date")).sendKeys("12");
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the datepicker
        driver.findElement(By.name("number_of_allowed_submissions")).clear();
        driver.findElement(By.name("number_of_allowed_submissions")).sendKeys("1");
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field

```

```

        // Click cancel
        try { Thread.sleep(1000); } catch (InterruptedException e) { }// TODO Auto
        WebElement element =
driver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div/button[@type='submit']
[1]"));
        element.click();
        // Check result
        // Page should give error message "Invalid date"
        assertTrue(driver.getPageSource().contains("Invalid date"));
        // But instead breaks down
        //assertTrue(driver.getPageSource().contains("TypeError"));
    }
    @Test
    public void test_case4()
    {
        // Fill input fields
        driver.findElement(By.name("quiz_name")).clear();
        driver.findElement(By.name("quiz_name")).sendKeys("a");
        driver.findElement(By.name("duration")).clear();
        driver.findElement(By.name("duration")).sendKeys("1");
        driver.findElement(By.name("open_date")).clear();
        driver.findElement(By.name("open_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.name("due_date")).clear();
        driver.findElement(By.name("due_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the datepicker
        driver.findElement(By.name("number_of_allowed_submissions")).clear();
        driver.findElement(By.name("number_of_allowed_submissions")).sendKeys("0");
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit
        try { Thread.sleep(1000); } catch (InterruptedException e) { }// TODO Auto
        WebElement element =
driver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div/button[@type='submit']
[1]"));
        element.click();
        // Check result
        // Page should give error message "Invalid duration"
        assertTrue(driver.getPageSource().contains("Invalid duration"));
        // But instead it accepts value
        //assertTrue(driver.getPageSource().contains("Question text"));
    }
    @Test
    public void test_case5()
    {
        // Fill input fields
        driver.findElement(By.name("quiz_name")).clear();
        driver.findElement(By.name("quiz_name")).sendKeys("a");
        driver.findElement(By.name("duration")).clear();
        driver.findElement(By.name("duration")).sendKeys("1");
        driver.findElement(By.name("open_date")).clear();
        driver.findElement(By.name("open_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.name("due_date")).clear();
        driver.findElement(By.name("due_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the datepicker
        driver.findElement(By.name("number_of_allowed_submissions")).clear();
        driver.findElement(By.name("number_of_allowed_submissions")).sendKeys("-1");
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit
        try { Thread.sleep(1000); } catch (InterruptedException e) { }// TODO Auto

```

```

        WebElement element =
driver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div/button[@type='submit']
[1]"));
        element.click();
        // Check result
        // Page should give error message "Invalid duration"
        assertTrue(driver.getPageSource().contains("Invalid duration"));
        // But instead it accepts value
        //assertTrue(driver.getPageSource().contains("Question text"));
    }
    @Test    // (expected = NullPointerException.class)
    public void test_case6()
    {
        // Fill input fields
        driver.findElement(By.name("quiz_name")).clear();
        driver.findElement(By.name("quiz_name")).sendKeys("a");
        driver.findElement(By.name("duration")).clear();
        driver.findElement(By.name("duration")).sendKeys("1");
        driver.findElement(By.name("open_date")).clear();
        driver.findElement(By.name("open_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.name("due_date")).clear();
        driver.findElement(By.name("due_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.cssSelector("body")).click();    // Click on the background
to deselect the datepicker
        driver.findElement(By.name("number_of_allowed_submissions")).clear();
        driver.findElement(By.name("number_of_allowed_submissions")).sendKeys("a");
        driver.findElement(By.cssSelector("body")).click();    // Click on the background
to deselect the input field
        // Submit
        try { Thread.sleep(1000); } catch (InterruptedException e) { }// TODO Auto
        WebElement element =
driver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div/button[@type='submit']
[1]"));
        element.click();
        // Check result
        // Page should give error message "Invalid duration"
        assertTrue(driver.getPageSource().contains("Invalid duration"));
        // But instead it doesn't give error message but it won't submit which is a good
behavior
        //assertTrue(driver.getPageSource().contains("Create a Quiz"));
    }
    @Test    // (expected = NullPointerException.class)
    public void test_case7()
    {
        // Fill input fields
        driver.findElement(By.name("quiz_name")).clear();
        driver.findElement(By.name("quiz_name")).sendKeys("");
        driver.findElement(By.name("duration")).clear();
        driver.findElement(By.name("duration")).sendKeys("1");
        driver.findElement(By.name("open_date")).clear();
        driver.findElement(By.name("open_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.name("due_date")).clear();
        driver.findElement(By.name("due_date")).sendKeys("11/14/2018 00:00");
        driver.findElement(By.cssSelector("body")).click();    // Click on the background
to deselect the datepicker
        driver.findElement(By.name("number_of_allowed_submissions")).clear();
        driver.findElement(By.name("number_of_allowed_submissions")).sendKeys("1");
        driver.findElement(By.cssSelector("body")).click();    // Click on the background
to deselect the input field
        // Submit
        try { Thread.sleep(1000); } catch (InterruptedException e) { }// TODO Auto
        WebElement element =
driver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div/button[@type='submit']
[1]"));

```



```
element.click();  
// Check result  
// Page should give error message "Please fill out this field."  
assertTrue(driver.getPageSource().contains("Please fill out this field"));  
// But instead it accepts value  
//assertTrue(driver.getPageSource().contains("Create a Quiz"));
```

```
}
```

```
}
```