

Create Question Test Requirements Input Space Partitions

1. Input variables:

- 6 input boxes: Question text, possible points, starting points, answer text, answer points
- 1 check box: Random order
- 1 drop down: Question type
- 2 buttons: Add question, Finish, clear answer, add answer

2. Definition of characteristics of input variables:

- char 1: text box is empty or not
- char 2: possible points, starting points, and answer points are numbers or not
- char 3: possible points, starting points, and answer points to 0
- char 4: check box is selected
- char 5: multiple choice, short answer, choose all
- char 6: form button is clicked

3. Partitions:

- char 1: [empty, not empty]
- char 2: [number, not number]
- char 3: [neg, 0, pos]
- char 4: [selected, not selected]
- char 5: [multiple choice, short answer, choose all]
- char 6: [add question, finish, clear answer, add answer]

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: [selected, not selected]
- char 5: [multiple choice, short answer, choose all]
- char 6: [add question, finish, clear answer, add answer]

6. Test requirements that satisfies Base Choice coverage:

Base tr:

- tr 1: ["a", 1, 1, selected, multiple choice, add question]

Base coverage:

- tr 2: ["a", 1, 1, selected, multiple choice, finish]
- tr 3: ["a", 1, 1, selected, multiple choice, clear answer]
- tr 4: ["a", 1, 1, selected, multiple choice, add answer]
- tr 5: ["a", 1, 1, selected, short answer, add question]
- tr 6: ["a", 1, 1, selected, choose all, add question]
- tr 7: ["a", 1, 1, not selected, multiple choice, add question]
- tr 8: ["a", 0, 0, selected, multiple choice, add question]
- tr 9: ["a", -1, -1, selected, multiple choice, add question]
- tr 10: ["a", a, a, selected, multiple choice, add question]
- tr 11: ["", 1, 1, selected, multiple choice, add question]

7. Test set:

- tr 1: "a", 1, 1, selected, multiple choice, "a", 1, add question
Expected output: created question shows up in quiz preview
- tr 2: "a", 1, 1, selected, multiple choice, "a", 1, finish
Expected output: move to "Edit question" page
- tr 3: "a", 1, 1, selected, multiple choice, "a", 1, clear answers
Expected output: text field of answer goes blank
- tr 4: ["a", 1, 1, selected, multiple choice, "a", 1, add answer]
Expected output: a new answer appears
- tr 5: ["a", 1, 1, selected, short answer, "a", 1, add question]
Expected output: same behavior as base case
- tr 6: ["a", 1, 1, selected, choose all, "a", 1, add question]
Expected output: same behavior as base case
- tr 7: ["a", 1, 1, not selected, multiple choice, "a", 1, add question]
Expected output: same behavior as base case
- tr 8: ["a", 0, 0, selected, multiple choice, "a", 0, add question]
Expected output: same behavior as base case
- tr 9: ["a", -1, -1, selected, multiple choice, "a", -1, add question]
Expected output: error message "invalid value"
- tr 10: ["a", a, a, selected, multiple choice, "a", a, add question]
Expected output: error message "invalid value"
- tr 11: ["", 1, 1, selected, multiple choice, "a", 1, add question]
Expected output: error message "Please enter question text"

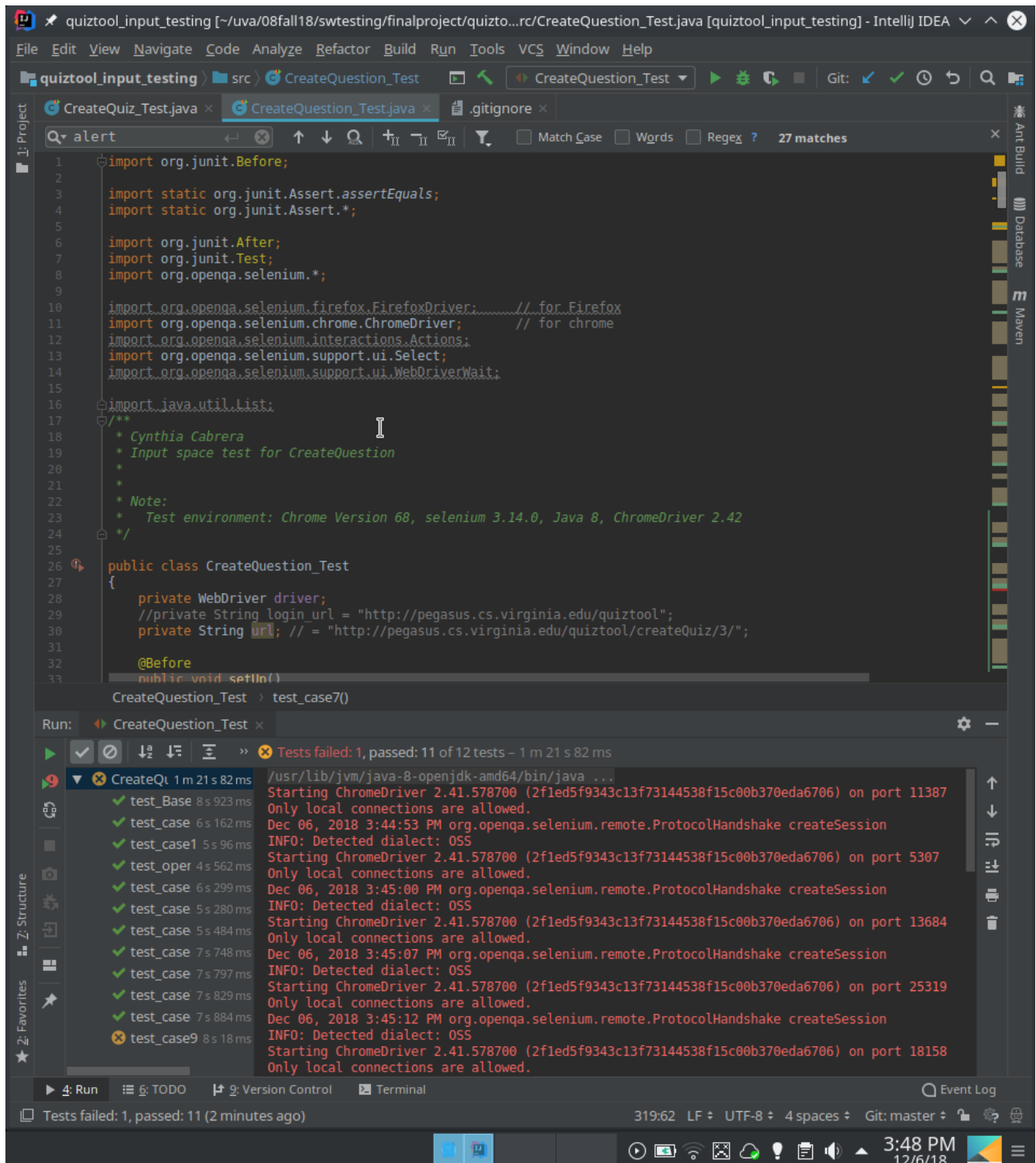
8. Additional tests

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

Test Results:

All the test cases pass except for test case 9 (see Fig. CQ1) because the create_question page doesn't meet the requirement. If a negative value is input into any of the points input fields, the page should not add the question since this is an invalid input. Instead the page creates the question and assigns negative values to the points both for total possible points, starting points, and answer points. All other feature meet the requirements and so all other tests pass.

Fig. CQ1: All tests pass except for test 9



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.*;
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.Select;
import org.openqa.selenium.support.ui.WebDriverWait;
import java.util.List;
/**
 * Cynthia Cabrera
 * Input space test for CreateQuestion
 *
 *
 * Note:
 * Test environment: Chrome Version 68, selenium 3.14.0, Java 8, ChromeDriver 2.42
 */
public class CreateQuestion_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'])[1]"));
        element.click();
        // Go to createQuiz
        url = "http://pegasus.cs.virginia.edu/quiztool/create_additional_questions/126/16";
        driver.get(url); // open the given url
    }
    @After
    public void teardown()
    {
        // Delete question if there is a question available to delete
        try {
            try { Thread.sleep(1000); } catch (InterruptedException e) { }
            driver.findElement(By.linkText("Delete")).click();
            try { Thread.sleep(1000); } catch (InterruptedException e) { }
            driver.switchTo().alert().accept();
            try { Thread.sleep(1000); } catch (InterruptedException e) { }
        } catch (NoSuchElementException e) { }
        driver.quit(); // close the browser
    }
    @Test
```

```

    public void test_openURL()
    {
        assertTrue(driver.getPageSource().contains("Add Questions")); // check if we are
on the right page
    }
    @Test
    public void test_Base() // test case #1
    {
        // Fill input fields
        driver.findElement(By.name("question_text")).clear();
        driver.findElement(By.name("question_text")).sendKeys("a");
        driver.findElement(By.name("question_points")).clear();
        driver.findElement(By.name("question_points")).sendKeys("1");
        driver.findElement(By.name("question_starting_points")).clear();
        driver.findElement(By.name("question_starting_points")).sendKeys("1");
        // Checkbox
        if ( !driver.findElement(By.name("randomize_answers")).isSelected() )
        {
            driver.findElement(By.name("randomize_answers")).click();
        }
        // Dropdown
        Select dropdown = new Select(driver.findElement(By.name("question_type")));
        dropdown.selectByVisibleText("Multiple Choice");
        // Fill input fields
        driver.findElement(By.name("answer_0")).clear();
        driver.findElement(By.name("answer_0")).sendKeys("a");
        driver.findElement(By.name("answer_weight_0")).clear();
        driver.findElement(By.name("answer_weight_0")).sendKeys("1");
        // Click background to make sure all java scripts finish running
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit (Add question)
        WebElement element =
driver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div[2]/button[@type='submit'
])[1]"));
        element.click();
        // Accept alert popup
        driver.switchTo().alert().accept();
        // Check result (Stays in same page, and new question is displayed on quiz preview)
        assertTrue(driver.getPageSource().contains("Q: a"));
    }
    @Test
    public void test_case2()
    {
        // Fill input fields
        driver.findElement(By.name("question_text")).clear();
        driver.findElement(By.name("question_text")).sendKeys("a");
        driver.findElement(By.name("question_points")).clear();
        driver.findElement(By.name("question_points")).sendKeys("1");
        driver.findElement(By.name("question_starting_points")).clear();
        driver.findElement(By.name("question_starting_points")).sendKeys("1");
        // Checkbox
        if ( !driver.findElement(By.name("randomize_answers")).isSelected() )
        {
            driver.findElement(By.name("randomize_answers")).click();
        }
        // Dropdown
        Select dropdown = new Select(driver.findElement(By.name("question_type")));
        dropdown.selectByVisibleText("Multiple Choice");
        // Fill input fields

```

```

        driver.findElement(By.name("answer_0")).clear();
        driver.findElement(By.name("answer_0")).sendKeys("a");
        driver.findElement(By.name("answer_weight_0")).clear();
        driver.findElement(By.name("answer_weight_0")).sendKeys("1");
        // Click background to make sure all java scripts finish running
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit (Finish)
        driver.findElement(By.linkText("Finish adding Questions")).click();
        //WebElement element =
driver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div[2]/button[@type='submit'
]][1]"));
        //element.click();
        // Accept alert popup
        driver.switchTo().alert().accept();
        // Check result (Goes to editing page)
        assertTrue(driver.getPageSource().contains("Editing"));
    }
    @Test
    public void test_case3()
    {
        // Fill input fields
        driver.findElement(By.name("question_text")).clear();
        driver.findElement(By.name("question_text")).sendKeys("a");
        driver.findElement(By.name("question_points")).clear();
        driver.findElement(By.name("question_points")).sendKeys("1");
        driver.findElement(By.name("question_starting_points")).clear();
        driver.findElement(By.name("question_starting_points")).sendKeys("1");
        // Checkbox
        if ( !driver.findElement(By.name("randomize_answers")).isSelected() )
        {
            driver.findElement(By.name("randomize_answers")).click();
        }
        // Dropdown
        Select dropdown = new Select(driver.findElement(By.name("question_type")));
        dropdown.selectByVisibleText("Multiple Choice");
        // Fill input fields
        driver.findElement(By.name("answer_0")).clear();
        driver.findElement(By.name("answer_0")).sendKeys("a");
        driver.findElement(By.name("answer_weight_0")).clear();
        driver.findElement(By.name("answer_weight_0")).sendKeys("1");
        // Click background to make sure all java scripts finish running
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit (clear answer)
        driver.findElement(By.id("clear_answer_0")).click();
        // Check result (answer should be empty)
        assertEquals("", driver.findElement(By.name("answer_0")).getAttribute("value"));
    }
    @Test
    public void test_case4()
    {
        // Fill input fields
        driver.findElement(By.name("question_text")).clear();
        driver.findElement(By.name("question_text")).sendKeys("a");
        driver.findElement(By.name("question_points")).clear();
        driver.findElement(By.name("question_points")).sendKeys("1");
        driver.findElement(By.name("question_starting_points")).clear();
        driver.findElement(By.name("question_starting_points")).sendKeys("1");
        // Checkbox

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        if ( !driver.findElement(By.name("randomize_answers")).isSelected() )
        {
            driver.findElement(By.name("randomize_answers")).click();
        }
        // Dropdown
        Select dropdown = new Select(driver.findElement(By.name("question_type")));
        dropdown.selectByVisibleText("Multiple Choice");
        // Fill input fields
        driver.findElement(By.name("answer_0")).clear();
        driver.findElement(By.name("answer_0")).sendKeys("a");
        driver.findElement(By.name("answer_weight_0")).clear();
        driver.findElement(By.name("answer_weight_0")).sendKeys("1");
        // Click background to make sure all java scripts finish running
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit (clear answer)
        driver.findElement(By.id("add_answer")).click();
        // Check result (answer_1 should have been created)
        WebElement element = null;
        try { element = driver.findElement(By.name("answer_1")); } catch
(NoSuchElementException e) { }
        assertNotEquals(null, element);
    }
    @Test
    public void test_case5()
    {
        // Fill input fields
        driver.findElement(By.name("question_text")).clear();
        driver.findElement(By.name("question_text")).sendKeys("a");
        driver.findElement(By.name("question_points")).clear();
        driver.findElement(By.name("question_points")).sendKeys("1");
        driver.findElement(By.name("question_starting_points")).clear();
        driver.findElement(By.name("question_starting_points")).sendKeys("1");
        // Checkbox
        if ( !driver.findElement(By.name("randomize_answers")).isSelected() )
        {
            driver.findElement(By.name("randomize_answers")).click();
        }
        // Dropdown
        Select dropdown = new Select(driver.findElement(By.name("question_type")));
        dropdown.selectByVisibleText("Short Answer");
        // Fill input fields
        driver.findElement(By.name("answer_0")).clear();
        driver.findElement(By.name("answer_0")).sendKeys("a");
        driver.findElement(By.name("answer_weight_0")).clear();
        driver.findElement(By.name("answer_weight_0")).sendKeys("1");
        // Click background to make sure all java scripts finish running
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit (Add question)
        WebElement element =
driver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div[2]/button[@type='submit'
])[1]"));
        element.click();
        // Accept alert popup
        driver.switchTo().alert().accept();
        // Check result (Stays in same page, and new question is displayed on quiz preview)
        assertTrue(driver.getPageSource().contains("Q: a"));
    }
    @Test

```

```

public void test_case6()
{
    // Fill input fields
    driver.findElement(By.name("question_text")).clear();
    driver.findElement(By.name("question_text")).sendKeys("a");
    driver.findElement(By.name("question_points")).clear();
    driver.findElement(By.name("question_points")).sendKeys("1");
    driver.findElement(By.name("question_starting_points")).clear();
    driver.findElement(By.name("question_starting_points")).sendKeys("1");
    // Checkbox
    if ( !driver.findElement(By.name("randomize_answers")).isSelected() )
    {
        driver.findElement(By.name("randomize_answers")).click();
    }
    // Dropdown
    Select dropdown = new Select(driver.findElement(By.name("question_type")));
    dropdown.selectByVisibleText("Choose All");
    // Fill input fields
    driver.findElement(By.name("answer_0")).clear();
    driver.findElement(By.name("answer_0")).sendKeys("a");
    driver.findElement(By.name("answer_weight_0")).clear();
    driver.findElement(By.name("answer_weight_0")).sendKeys("1");
    // Click background to make sure all java scripts finish running
    driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
    // Submit (Add question)
    WebElement element =
driver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div[2]/button[@type='submit'
])[1]"));
    element.click();
    // Accept alert popup
    driver.switchTo().alert().accept();
    // Check result (Stays in same page, and new question is displayed on quiz preview)
    assertTrue(driver.getPageSource().contains("Q: a"));
}
@Test
public void test_case7()
{
    // Fill input fields
    driver.findElement(By.name("question_text")).clear();
    driver.findElement(By.name("question_text")).sendKeys("a");
    driver.findElement(By.name("question_points")).clear();
    driver.findElement(By.name("question_points")).sendKeys("1");
    driver.findElement(By.name("question_starting_points")).clear();
    driver.findElement(By.name("question_starting_points")).sendKeys("1");
    // Checkbox
    if ( driver.findElement(By.name("randomize_answers")).isSelected() )
    {
        driver.findElement(By.name("randomize_answers")).click();
    }
    // Dropdown
    Select dropdown = new Select(driver.findElement(By.name("question_type")));
    dropdown.selectByVisibleText("Multiple Choice");
    // Fill input fields
    driver.findElement(By.name("answer_0")).clear();
    driver.findElement(By.name("answer_0")).sendKeys("a");
    driver.findElement(By.name("answer_weight_0")).clear();
    driver.findElement(By.name("answer_weight_0")).sendKeys("1");
    // Click background to make sure all java scripts finish running

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```

        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit (Add question)
        WebElement element =
driver.findElement(By.xpath("(//html/body/div[1]/div/div[2]/form/div[2]/button[@type='submit'
])[1]"));
        element.click();
        // Accept alert popup
        driver.switchTo().alert().accept();
        // Check result (Stays in same page, and new question is displayed on quiz preview)
        assertTrue(driver.getPageSource().contains("Q: a"));
    }
    @Test
    public void test_case8() // test case #1
    {
        // Fill input fields
        driver.findElement(By.name("question_text")).clear();
        driver.findElement(By.name("question_text")).sendKeys("a");
        driver.findElement(By.name("question_points")).clear();
        driver.findElement(By.name("question_points")).sendKeys("0");
        driver.findElement(By.name("question_starting_points")).clear();
        driver.findElement(By.name("question_starting_points")).sendKeys("0");
        // Checkbox
        if ( !driver.findElement(By.name("randomize_answers")).isSelected() )
        {
            driver.findElement(By.name("randomize_answers")).click();
        }
        // Dropdown
        Select dropdown = new Select(driver.findElement(By.name("question_type")));
        dropdown.selectByVisibleText("Multiple Choice");
        // Fill input fields
        driver.findElement(By.name("answer_0")).clear();
        driver.findElement(By.name("answer_0")).sendKeys("a");
        driver.findElement(By.name("answer_weight_0")).clear();
        driver.findElement(By.name("answer_weight_0")).sendKeys("0");
        // Click background to make sure all java scripts finish running
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit (Add question)
        WebElement element =
driver.findElement(By.xpath("(//html/body/div[1]/div/div[2]/form/div[2]/button[@type='submit'
])[1]"));
        element.click();
        // Accept alert popup
        try { driver.switchTo().alert().accept(); } catch (NoAlertPresentException e) { }
        //driver.switchTo().alert().accept();
        // Check result (Stays in same page, and new question is displayed on quiz preview)
        assertTrue(driver.getPageSource().contains("Q: a"));
    }
    @Test
    public void test_case9() // test case #1
    {
        // Fill input fields
        driver.findElement(By.name("question_text")).clear();
        driver.findElement(By.name("question_text")).sendKeys("a");
        driver.findElement(By.name("question_points")).clear();
        driver.findElement(By.name("question_points")).sendKeys("-1");
        driver.findElement(By.name("question_starting_points")).clear();
        driver.findElement(By.name("question_starting_points")).sendKeys("-1");
        // Checkbox

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        if ( !driver.findElement(By.name("randomize_answers")).isSelected() )
        {
            driver.findElement(By.name("randomize_answers")).click();
        }
        // Dropdown
        Select dropdown = new Select(driver.findElement(By.name("question_type")));
        dropdown.selectByVisibleText("Multiple Choice");
        // Fill input fields
        driver.findElement(By.name("answer_0")).clear();
        driver.findElement(By.name("answer_0")).sendKeys("a");
        driver.findElement(By.name("answer_weight_0")).clear();
        driver.findElement(By.name("answer_weight_0")).sendKeys("-1");
        // Click background to make sure all java scripts finish running
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit (Add question)
        WebElement element =
driver.findElement(By.xpath("(//html/body/div[1]/div/div[2]/form/div[2]/button[@type='submit'
]))[1]"));
        element.click();
        // Accept alert popup
        try { driver.switchTo().alert().accept(); } catch (NoAlertPresentException e) { }
        //driver.switchTo().alert().accept();
        // Check result (Stays in same page, and question is not created)
        assertFalse(driver.getPageSource().contains("Q: a"));
    }
    @Test
    public void test_case10() // test case #1
    {
        // Fill input fields
        driver.findElement(By.name("question_text")).clear();
        driver.findElement(By.name("question_text")).sendKeys("a");
        driver.findElement(By.name("question_points")).clear();
        driver.findElement(By.name("question_points")).sendKeys("a");
        driver.findElement(By.name("question_starting_points")).clear();
        driver.findElement(By.name("question_starting_points")).sendKeys("a");
        // Checkbox
        if ( !driver.findElement(By.name("randomize_answers")).isSelected() )
        {
            driver.findElement(By.name("randomize_answers")).click();
        }
        // Dropdown
        Select dropdown = new Select(driver.findElement(By.name("question_type")));
        dropdown.selectByVisibleText("Multiple Choice");
        // Fill input fields
        driver.findElement(By.name("answer_0")).clear();
        driver.findElement(By.name("answer_0")).sendKeys("a");
        driver.findElement(By.name("answer_weight_0")).clear();
        driver.findElement(By.name("answer_weight_0")).sendKeys("a");
        // Click background to make sure all java scripts finish running
        driver.findElement(By.cssSelector("body")).click(); // Click on the background
to deselect the input field
        // Submit (Add question)
        WebElement element =
driver.findElement(By.xpath("(//html/body/div[1]/div/div[2]/form/div[2]/button[@type='submit'
]))[1]"));
        element.click();
        // Accept alert popup
        try { driver.switchTo().alert().accept(); } catch (NoAlertPresentException e) { }
        //driver.switchTo().alert().accept();

```

```

        // Check result (Stays in same page, and question is not created)
        assertFalse(driver.getPageSource().contains("Q: a"));
    }
    @Test
    public void test_case11()        // test case #1
    {
        // Fill input fields
        driver.findElement(By.name("question_text")).clear();
        driver.findElement(By.name("question_text")).sendKeys("");
        driver.findElement(By.name("question_points")).clear();
        driver.findElement(By.name("question_points")).sendKeys("1");
        driver.findElement(By.name("question_starting_points")).clear();
        driver.findElement(By.name("question_starting_points")).sendKeys("1");
        // Checkbox
        if ( !driver.findElement(By.name("randomize_answers")).isSelected() )
        {
            driver.findElement(By.name("randomize_answers")).click();
        }
        // Dropdown
        Select dropdown = new Select(driver.findElement(By.name("question_type")));
        dropdown.selectByVisibleText("Multiple Choice");
        // Fill input fields
        driver.findElement(By.name("answer_0")).clear();
        driver.findElement(By.name("answer_0")).sendKeys("");
        driver.findElement(By.name("answer_weight_0")).clear();
        driver.findElement(By.name("answer_weight_0")).sendKeys("1");
        // Click background to make sure all java scripts finish running
        driver.findElement(By.cssSelector("body")).click();        // Click on the background
        // to deselect the input field
        // Submit (Add question)
        WebElement element =
driver.findElement(By.xpath("(//html/body/div[1]/div/div[2]/form/div[2]/button[@type='submit'
])[1]"));
        element.click();
        // Accept alert popup
        try { driver.switchTo().alert().accept(); } catch (NoAlertPresentException e) { }
        //driver.switchTo().alert().accept();
        // Check result (Stays in same page, and question is not created)
        assertFalse(driver.getPageSource().contains("Q: a"));
    }
}

```