

Ferramenta Selenium

O que é

- A ferramenta Selenium permite que se realizam testes automatizados de aplicativos Web
- Em particular, teste de regressão
- IDE Selenium
- Selenium WebDriver
- <http://www.seleniumhq.org/>

Os dois componentes

Which part of Selenium is appropriate for me?

Selenium WebDriver



If you want to

- create robust, browser-based regression automation suites and tests
- scale and distribute scripts across many environments

Then you want to use [Selenium WebDriver](#); a collection of language specific bindings to drive a browser -- the way it is meant to be driven.

Selenium WebDriver is the successor of [Selenium Remote Control](#) which has been officially deprecated. The Selenium Server (used by both WebDriver and Remote Control) now also includes built-in grid capabilities.

Selenium IDE



If you want to

- create quick bug reproduction scripts
- create scripts to aid in automation-aided exploratory testing

Then you want to use [Selenium IDE](#); a Firefox add-on that will do simple record-and-playback of interactions with the browser.

Vamos começar com IDE

- O IDE permite que você navegue no browser
- E vá registrando todos os passos
 - clicar num link
 - digitar uma url
 - apertar botão back
- Ao finalizar a gravação, os passos podem ser gravados
- E depois reproduzidos

Instalação

- <http://www.seleniumhq.org/>

Which part of Selenium is appropriate for me?

Selenium WebDriver



If you want to

- create robust, browser-based regression automation suites and tests
- scale and distribute scripts across many environments

Then you want to use Selenium WebDriver

Selenium IDE



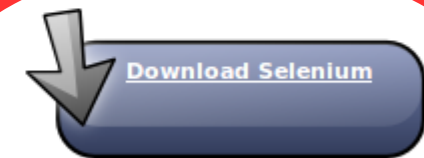
If you want to

- create quick bug reproduction scripts
- create scripts to aid in automation-aided exploratory testing

Selenium is a suite of tools to automate web browsers across many platforms.

Selenium...

- runs in [many browsers](#) and [operating systems](#)
- can be controlled by many [programming languages](#) and [testing frameworks](#).



Donate to Selenium

Instalação

- <http://www.seleniumhq.org/download/>

Selenium IDE

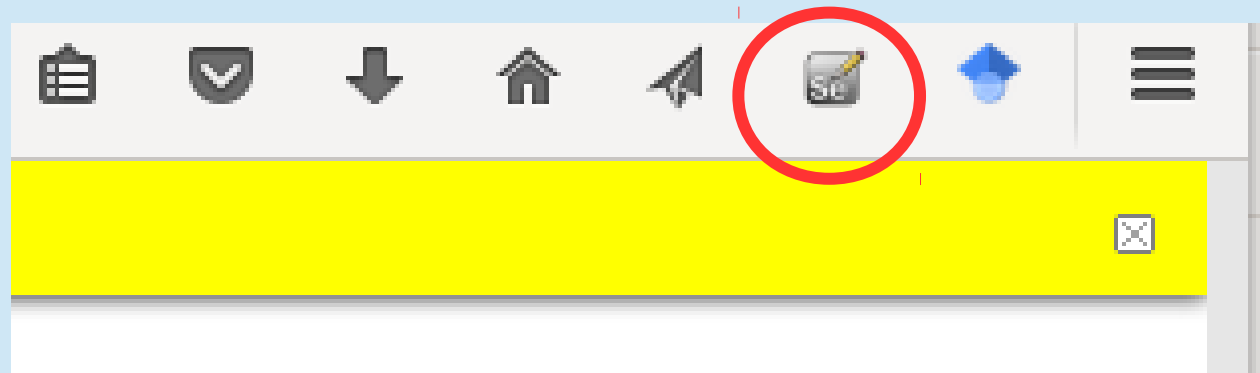
Selenium IDE is a Firefox plugin which records and plays back user interactions with the browser. Use this to either create simple scripts or assist in exploratory testing. It can also export Remote Control or WebDriver scripts, though they tend to be somewhat brittle and should be overhauled into some sort of Page Object-y structure for any kind of resiliency.

Download latest released version [from addons.mozilla.org](http://addons.mozilla.org) or view the [Release Notes](#) and then [install some plugins](#).

Download [previous versions here](#).

Usando IDE

- Feita a instalação aparece no canto superior direito o icone do IDE



- Clique e veja o que acontece

Usando IDE – gravar



Usando IDE – gravar

The screenshot shows the Selenium IDE 2.9.1 interface. The URL Base is set to `http://icmc.usp.br/`. The interface includes a menu bar (Arquivo (F), Editar, Ações, Opções, Ajuda), a toolbar with playback controls (Fast, Slow, Play, Stop, Refresh), and a main workspace. On the left, there is a 'Test Case' pane with an 'Untitled' entry. The main workspace is divided into two tabs: 'Tabela' (Table) and 'Código-Fonte' (Code). The 'Tabela' tab displays a table with three columns: 'Comando', 'Alvo', and 'Valor'. Below the table, there are input fields for 'Comando', 'Alvo', and 'Valor', along with 'Select' and 'Procurar' buttons. At the bottom, there is a 'Runs' section showing 0 runs and 0 failures, and a 'Mensagens' (Messages) section with tabs for Reference, UI-Element, and Rollup.

Esse é o controle do IDE.
Nele podemos dar comandos para gravar ou reproduzir casos de teste.

Usando IDE – gravar

The screenshot shows the Selenium IDE 2.9.1 interface. The URL Base is set to `http://icmc.usp.br/`. The interface includes a menu bar (Arquivo (F), Editar, Ações, Opções, Ajuda), a toolbar with playback controls (Fast, Slow, play, pause, stop, refresh), and a main workspace. The workspace is divided into a Test Case pane (containing 'Untitled') and a table for recording actions. The table has columns for 'Comando', 'Alvo', and 'Valor'. Below the table are input fields for 'Comando', 'Alvo', and 'Valor', along with 'Select' and 'Procurar' buttons. A red circular button in the top right corner of the workspace is highlighted with a green arrow, indicating the recording function.

Apertando esse botão, tudo o que fizemos no browser vai ser gravado. Até o botão seja apertado novamente.

Vamos tentar

- Inicie a gravação
- Digite a url: www.icmc.usp.br
- Clique em “Pessoas”
- Clique em “Docentes”
- Procure o nome “Silva”
- Selecione um professor
- Termine a gravação

Resultado

Untitled (untitled suite) - Selenium IDE 2.9.1 *

Arquivo (F) Editar Ações Opções Ajuda

URL Base

Fast Slow

Test Case

Procura docente Silva *

Tabela Código-Fonte

Comando	Alvo	Valor
click	link=Docentes	
type	name=nome_busca	Silva
click	css=button.btn.btn-primary	
clickAndWait	//img[contains(@src,'https://...]	

Comando

Alvo

Valor

Runs: 1

Failures: 0

Mensagens Reference UI-Element Rollup

open(url)
Arguments:
• url - the URL to open; may be relative or absolute
Opens an URL in the test frame. This accepts both relative and absolute URLs. The "open" command waits for the page to load

Resultado

The screenshot shows the Selenium IDE 2.9.1 interface. The URL Base is set to `http://www.icmc.usp.br/`. The test case is named "Procura docente Silva *", which is circled in blue. A text annotation next to it says "Nome, que pode ser alterado". The test case contains the following commands:

Comando	Alvo	Valor
click	link=Docentes	
type	name=nome_busca	Silva
click	css=button.btn.btn-primary	
clickAndWait	//img[contains(@src,'https://...]	

Below the table, the "Comando" field is empty, and the "Alvo" and "Valor" fields are also empty. The "Alvo" field has "Select" and "Procurar" buttons next to it. The status bar shows 1 Run and 0 Failures.

At the bottom, the "Reference" tab is active, showing the documentation for the `open(url)` command:

```

open(url)
Arguments:
  • url - the URL to open; may be relative or absolute
Opens an URL in the test frame. This accepts both relative and absolute URLs. The "open" command waits for the page to load
  
```

Resultado

The screenshot shows the Selenium IDE 2.9.1 interface. The URL Base is set to `http://www.icmc.usp.br/`. The test case is named "Procura docente Silva *". The "Comandos executados" (Executed Commands) table is highlighted with a blue oval and contains the following data:

Comando	Alvo	Valor
click	link=Docentes	
type	name=nome_busca	Silva
click	css=button.btn.btn-primary	
clickAndWait	//img[contains(@src,'https://...]	

Below the table, the "Comando" dropdown is set to "click", the "Alvo" field is empty, and the "Valor" field is empty. The "Select" and "Procurar" buttons are visible. The status bar shows 1 Run and 0 Failures.

Annotations on the image:

- A blue oval around the test case name "Procura docente Silva *" is accompanied by the text "Nome, que pode ser alterado".
- A blue oval around the "Comandos executados" table is accompanied by the text "Comandos executados".

At the bottom of the interface, the "Reference" tab is active, showing the documentation for the `open(url)` command:

```

open(url)
Arguments:
  • url - the URL to open; may be relative or absolute
Opens an URL in the test frame. This accepts both relative and absolute URLs. The "open" command waits for the page to load
  
```

Resultado

The screenshot shows the Selenium IDE 2.9.1 interface. The URL Base is set to `http://www.icmc.usp.br/`. The test case is named "Procura docente Silva *". The executed commands are listed in a table below.

Nome, que pode ser alterado

Comandos executados

Comando	Alvo	Valor
click	link=Docentes	
type	name=nome_busca	Silva
click	css=button.btn.btn-primary	
clickAndWait	//img[contains(@src,'https://...]	

Comando:

Alvo:

Valor:

Runs: 1
Failures: 0

Descrição dos comandos

open(url)
Arguments:
• url - the URL to open; may be relative or absolute
Opens an URL in the test frame. This accepts both relative and absolute URLs. The "open" command waits for the page to load

Reproduzindo

Esse botão vai fazer com que o browser reproduza a navegação

Untitled (untitled suite) - Selenium IDE 2.9.1 *

Arquivo (F) Editar Ações Opções Ajuda

URL Base

Fast Slow

Comando	Alvo	Valor
click	link=Docentes	
type	name=nome_busca	Silva
click	css=button.btn.btn-primary	
clickAndWait	//img[contains(@src,'https://...]	

Comando

Alvo

Valor

Runs: 1
Failures: 0

Mensagens Reference UI-Element Rollup

open(url)
Arguments:
• url - the URL to open; may be relative or absolute
Opens an URL in the test frame. This accepts both relative and absolute URLs. The "open" command waits for the page to load

Reproduzindo

The screenshot shows the Selenium IDE 2.9.1 interface. The URL Base is set to `http://www.icmc.usp.br/`. The test suite contains the following commands:

Comando	Alvo	Valor
click	link=Docentes	
type	name=nome_busca	Silva
click	css=button.btn.btn-primary	
clickAndWait	//img[contains(@src,'https://...]	

Below the table, the 'Comando' field is empty, and the 'Alvo' and 'Valor' fields are also empty. The 'Select' and 'Procurar' buttons are visible. The 'Runs' section shows 1 successful run and 0 failures. The 'open(uri)' command is highlighted in the bottom panel, with its arguments and description:

```

open(uri)
Arguments:
  • url - the URL to open; may be relative or absolute
Opens an URL in the test frame. This accepts both relative and absolute URLs. The "open" command waits for the page to load
    
```

Esse botão vai fazer com que o browser reproduza a navegação

Indica se os resultados estão corretos

O que são resultados corretos

- Por exemplo, no nosso script é possível que o último comando não possa ser executado
- Ao clicar no link “Docente” a página não é alterada
- Ela apenas muda. Mas o script não espera isso acontecer

Consertando o script

Procura docente Silva (untitled suite) - Selenium IDE 2.9.1 *

Arquivo (F) Editar Ações Opções Ajuda

URL Base

Fast Slow

Test Case

Procura docente Silva *

Comando	Alvo	Valor
clickAndWait	link=Pessoas	
click	link=Docentes	
pause	10000	
type	name=nome_busca	Silva
click	css=button.btn.btn-primary	
pause	10000	

Comando

Alvo

Valor

Runs: **1**

Failures: **0**

Mensagens Reference UI-Element Rollup

pause(waitTime)

Arguments:

- waitTime - the amount of time to sleep (in milliseconds)

Wait for the specified amount of time (in milliseconds)

Verificando resultados

- Ao criar casos de teste, podemos acrescentar comandos que façam verificações dos resultados que aparecem no browser.
- Ao final da pesquisa, queremos verificar se lá em cima aparece a categoria “Docente”

Verificando resultados

Procura docente Silva (untitled suite) - Selenium IDE 2.9.1 *

Arquivo (F) Editar Ações Opções Ajuda

URL Base

Fast Slow

Test Case

Procura docente Silva *

Comando	Alvo	Valor
click	css=button.btn.btn-primary	
pause	10000	
clickAndWait	//img[contains(@src,'https://...]	
pause	10000	
assertText	css=h4.media-heading	Docente:

Comando

Alvo

Valor

Runs: 1

Failures: 0

Mensagens Reference UI-Element Rollup

Returns:
the text of the element
Gets the text of an element. This works for any element that contains text. This command uses either the textContent (Mozilla-like browsers) or the innerText (IE-like browsers) of the element, which is the rendered text shown to the user.

Verificando resultados

Procura docente Silva (untitled suite) - Selenium IDE 2.9.1 *

Arquivo (F) Editar Ações Opções Ajuda

URL Base

Fast Slow

Test Case

Procura docente Silva *

Comando	Alvo	Valor
click	css=button.btn.btn-primary	
pause	10000	
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pause	10000	
assertText	css=h4.media-heading	Docente:

Comando

Alvo

Valor

Runs: 1

Failures: 0

Mensagens Reference UI-Element Rollup

Returns:
the text of the element
Gets the text of an element. This works for any element that contains text. This command uses either the textContent (Mozilla-like browsers) or the innerText (IE-like browsers) of the element, which is the rendered text shown to the user.

Salvando

- O caso de teste pode ser salvo
- Vários casos de teste podem ser salvos salvos como uma “Test suite”
- E casos de teste ou teste suites podem ser exportados
- Arquivo → Exportar teste como → Java/JUnit4/Webdriver

JUnit

```
public class ProcuraDocenteSilva {
    private WebDriver driver;
    private String baseUrl;
    private boolean acceptNextAlert = true;
    private StringBuffer verificationErrors = new StringBuffer();

    @Before
    public void setUp() throws Exception {
        driver = new FirefoxDriver();
        baseUrl = "http://www.icmc.usp.br/";
        driver.manage().timeouts().implicitlyWait(30, TimeUnit.SECONDS);
    }
}
```


JUnit

```
@Test
```

```
public void testProcuraDocenteSilva() throws Exception {  
    driver.get(baseUrl + "/");  
    driver.findElement(By.linkText("Pessoas")).click();  
    driver.findElement(By.linkText("Docentes")).click();  
    driver.findElement(By.name("nome_busca")).clear();  
    driver.findElement(By.name("nome_busca")).sendKeys("Silva");  
    driver.findElement(By.cssSelector("button.btn.btn-primary")).click();  
  
    driver.findElement(By.xpath("//img[contains(@src,'https://web.icmc.usp.br/SCAPINST/fotos_pessoas/5765587.jpg')]")).click();  
  
    assertEquals("Docente:", driver.findElement(By.cssSelector("h4.media-heading")).getText());  
}
```

JUnit

```
@Test
public void testProcuraDocenteSilva() throws Exception {
    driver.get(baseUrl + "/");
    driver.findElement(By.WebDriver s")).click();
    driver.findElement(By.linkText("Docentes")).click();
    driver.findElement(By.name("nome_busca")).clear();
    driver.findElement(By.name("nome_busca")).sendKeys("Silva");
    driver.findElement(By.cssSelector("button.btn.btn-primary")).click();

    driver.findElement(By.xpath("//img[contains(@src,'https://web.icmc.usp.br/SCAPINST/fotos_pessoas/5765587.jpg')]")).click();

    assertEquals("Docente:", driver.findElement(By.cssSelector("h4.media-heading")).getText());
}
```

WebDriver

- É uma biblioteca que vai permitir que você controle a execução do browser de dentro de um programa Java
- Ou outra linguagem
- Fazer o download

WebDriver – download

- <http://www.seleniumhq.org/download/>

Selenium Client & WebDriver Language Bindings

In order to create scripts that interact with the Selenium Server (Selenium RC, Selenium Remote WebDriver) or create local Selenium WebDriver scripts, you need to make use of language-specific client drivers. These languages include both 1.x and 2.x style clients.

While language bindings for [other languages exist](#), these are the core ones that are supported by the main project hosted on google code.

Language	Client Version	Release Date			
Java	3.4.0	2017-04-21	Download	Change log	Javadoc
C#	3.4.0	2017-04-21	Download	Change log	API docs
Ruby	3.4.0	2017-04-21	Download	Change log	API docs
Python	3.4.1	2017-04-27	Download	Change log	API docs
Javascript (Node)	3.4.0	2017-04-21	Download	Change log	API docs

WebDriver – download

- <http://www.seleniumhq.org/download/>

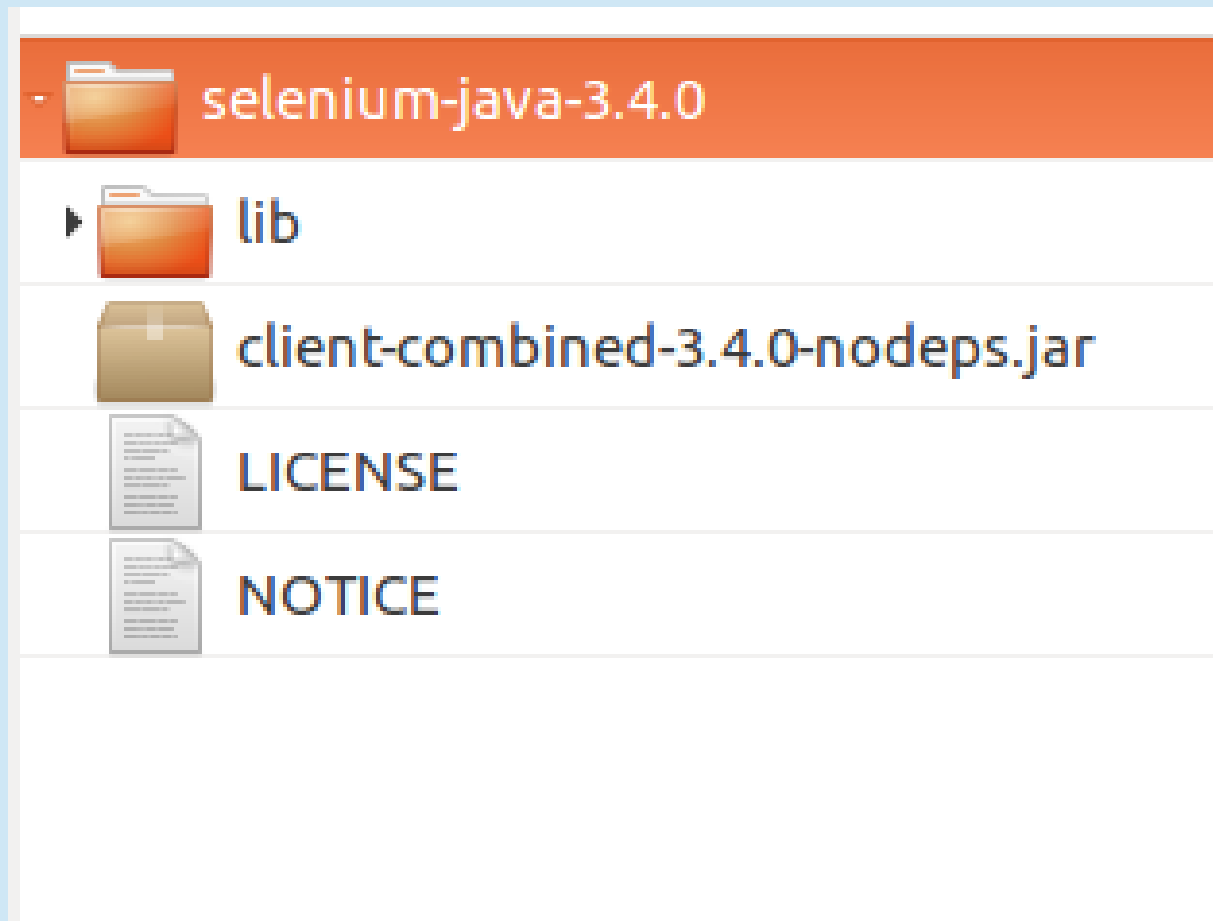
Selenium Client & WebDriver Language Bindings

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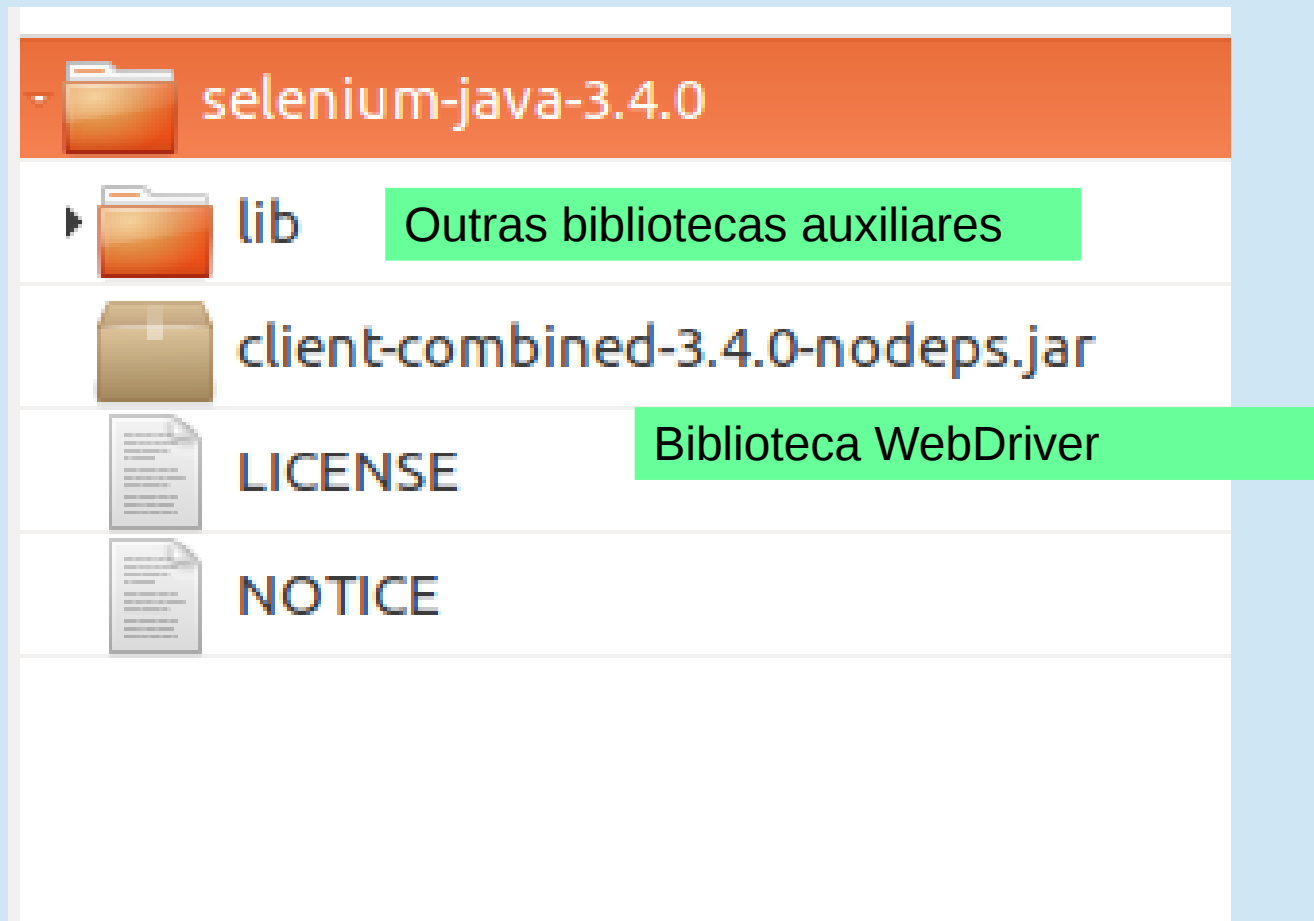
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Python	3.4.1	2017-04-27	Download	Change log	API docs
Javascript (Node)	3.4.0	2017-04-21	Download	Change log	API docs

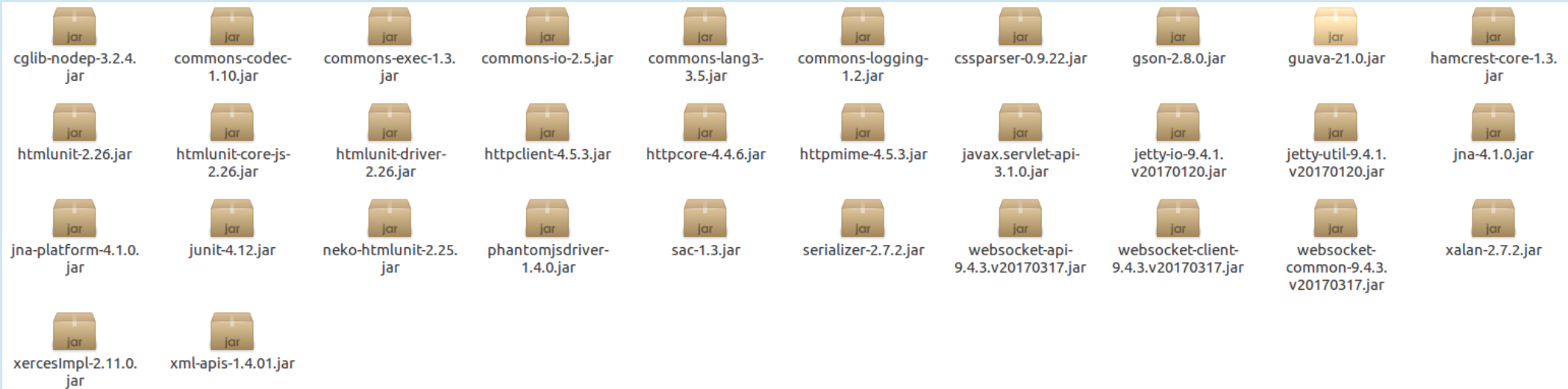
WebDriver – conteúdo



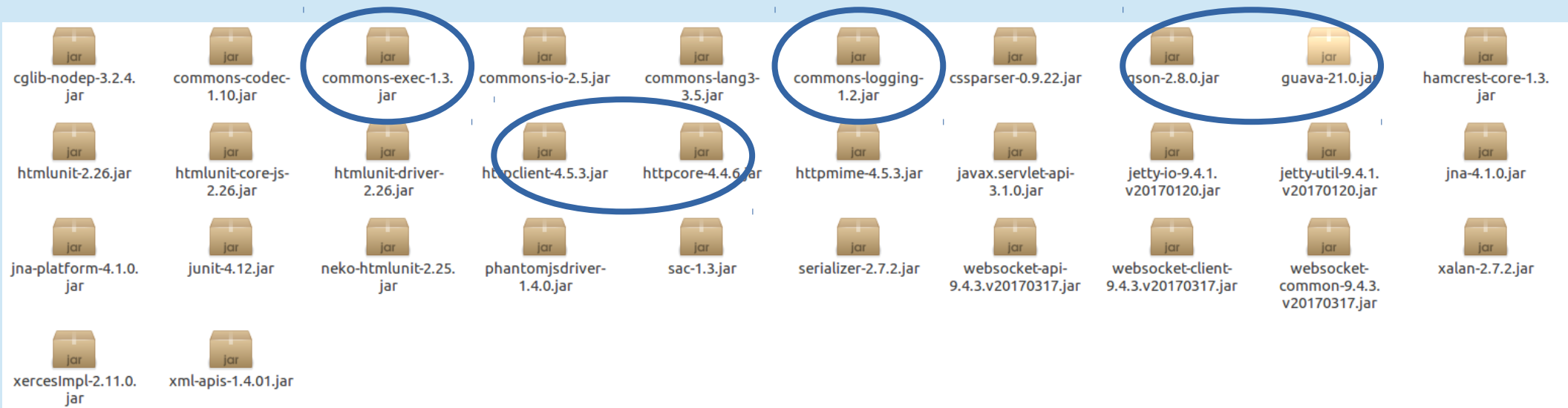
WebDriver – conteúdo



WebDriver – conteúdo



WebDriver – conteúdo



Mais algumas coisinhas

- Usar Java8
- Fazer download geckodriver e descompactar
 - <https://github.com/mozilla/geckodriver/releases>
- Registrar o driver no código
- Corrigir o código
- Executar como JUnit

Registrar o driver

@Before

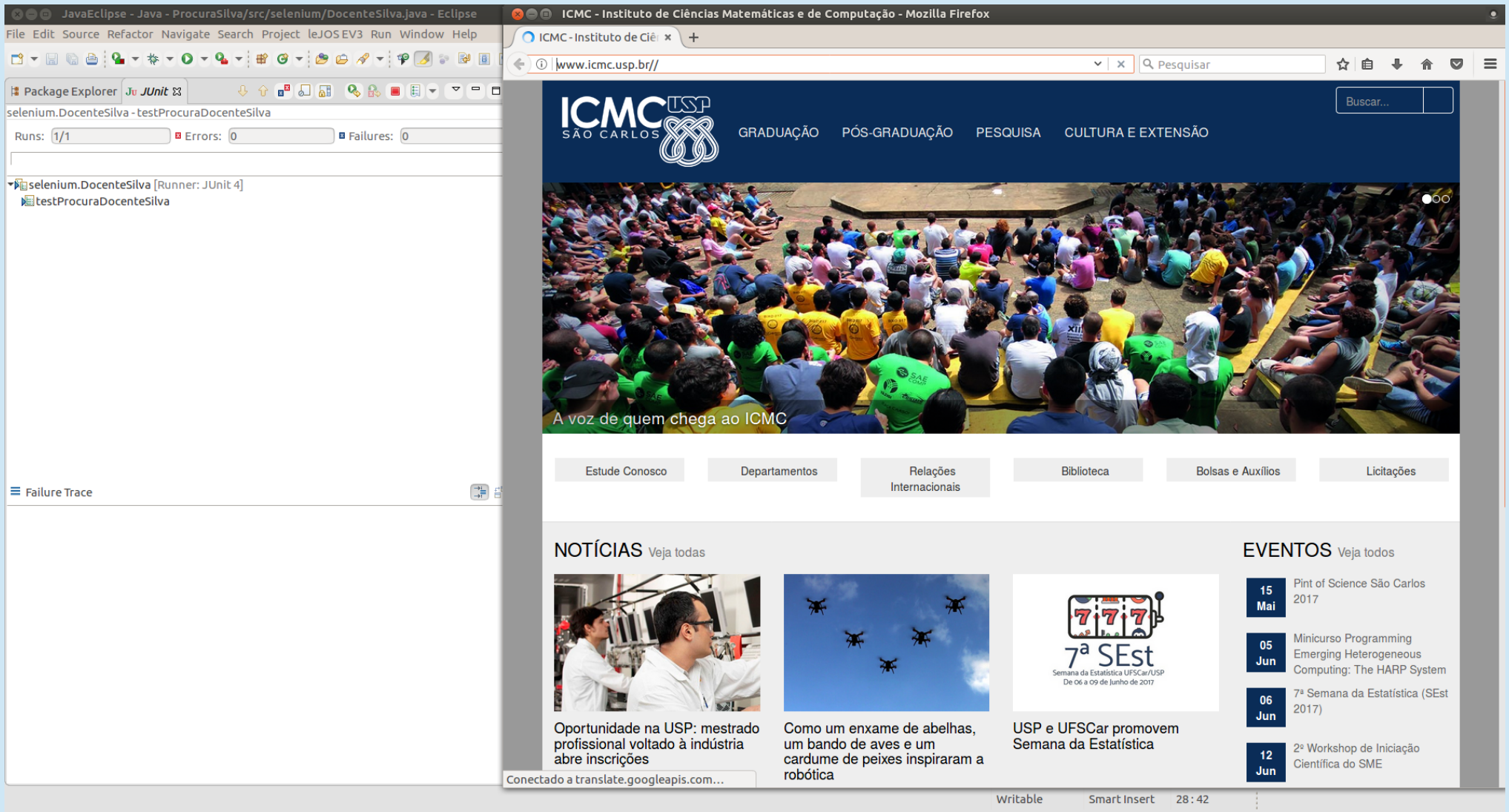
```
public void setUp() throws Exception {  
  
    System.setProperty("webdriver.firefox.marionette", <gecko>);  
  
    driver = new FirefoxDriver();  
  
    baseUrl = "http://www.icmc.usp.br/";  
  
    driver.manage().timeouts().implicitlyWait(30,  
                                                TimeUnit.SECONDS);  
  
}
```

Corrigir o código

@Test

```
public void testProcuraDocenteSilva() throws Exception {  
    driver.get(baseUrl + "/");  
    driver.findElement(By.linkText("Pessoas")).click();  
    driver.findElement(By.linkText("Docentes")).click();  
    Thread.sleep(10000);  
}
```

Executar



The image shows a dual-screen setup. On the left is the Eclipse IDE with a Selenium test running. On the right is a Mozilla Firefox browser displaying the ICMC website.

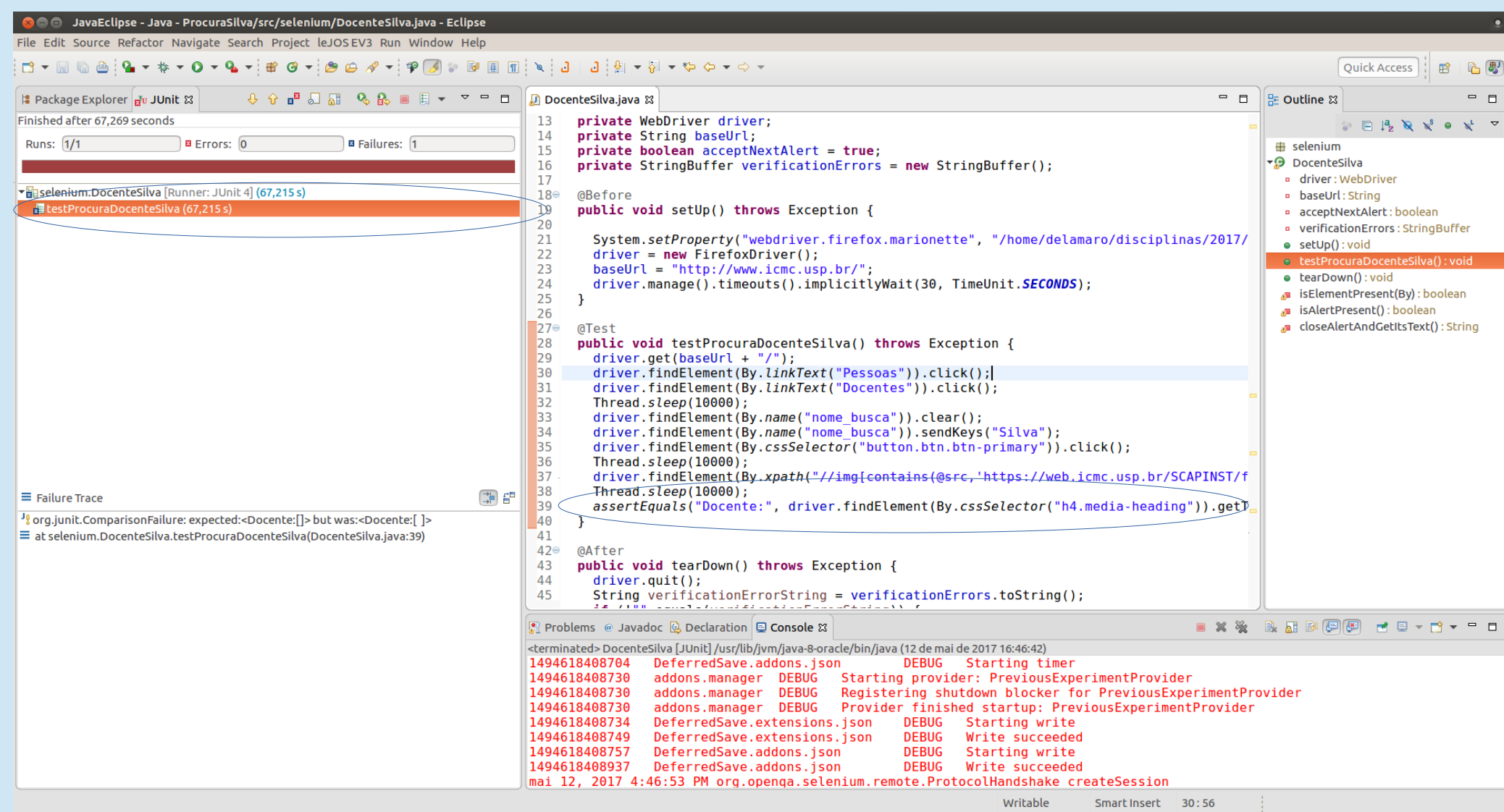
Left Window (Eclipse):

- File Edit Source Refactor Navigate Search Project leJOSEV3 Run Window Help
- Package Explorer: `JUnit`
- Test Runner: `selenium.DocenteSilva - testProcuraDocenteSilva`
- Runs: 1/1 | Errors: 0 | Failures: 0
- Test Case: `selenium.DocenteSilva [Runner: JUnit 4]`
- Sub-test: `testProcuraDocenteSilva`
- Failure Trace: (empty)

Right Window (Firefox):

- Address bar: `www.icmc.usp//`
- Search bar: `Pesquisar`
- Navigation menu: `GRADUAÇÃO`, `PÓS-GRADUAÇÃO`, `PESQUISA`, `CULTURA E EXTENSÃO`
- Hero image: A large group of people sitting on the ground in a circle, with the text `A voz de quem chega ao ICMC`.
- Navigation buttons: `Estude Conosco`, `Departamentos`, `Relações Internacionais`, `Biblioteca`, `Bolsas e Auxílios`, `Licitações`
- NOTÍCIAS `Veja todas`:
 - `Oportunidade na USP: mestrado profissional voltado à indústria abre inscrições`
 - `Como um enxame de abelhas, um bando de aves e um cardume de peixes inspiraram a robótica`
 - `USP e UFSCar promovem Semana da Estatística`
- EVENTOS `Veja todos`:
 - `15 Mai` `Pint of Science São Carlos 2017`
 - `05 Jun` `Minicurso Programming Emerging Heterogeneous Computing: The HARP System`
 - `06 Jun` `7ª Semana da Estatística (SEst 2017)`
 - `12 Jun` `2º Workshop de Iniciação Científica do SME`

Executar



The screenshot shows the Eclipse IDE interface with the Selenium test suite 'DocenteSilva' being executed. The Package Explorer on the left shows the test results: 'Finished after 67,269 seconds', 'Runs: 1/1', 'Errors: 0', and 'Failures: 1'. The test 'testProcuraDocenteSilva' is highlighted in red, indicating a failure.

The main editor displays the source code for 'Docentesilva.java'. The code includes a WebDriver driver, a baseUrl, and a verificationErrors list. The test method 'testProcuraDocenteSilva' performs the following actions:

- Opens the browser at the baseUrl.
- Clicks on the 'Pessoas' link.
- Clicks on the 'Docentes' link.
- Waits for 10000ms.
- Clears the search input field.
- Types 'Silva' into the search input field.
- Clicks on the primary button.
- Waits for 10000ms.
- Attempts to find an image with the src 'https://web.icmc.usp.br/SCAPINST/f'.
- Asserts that the text of the h4 media-heading is 'Docente:'.

The failure trace at the bottom of the Package Explorer shows the error: 'org.junit.ComparisonFailure: expected:<Docente:[]> but was:<Docente:[]> at selenium.DocenteSilva.testProcuraDocenteSilva(Docentesilva.java:39)'. This indicates that the actual text found in the h4 media-heading is 'Docente: []' instead of the expected 'Docente:'.

The Console window at the bottom shows the following output:

```

<terminated> DocenteSilva [JUnit] /usr/lib/jvm/java-8-oracle/bin/java (12 de mai de 2017 16:46:42)
1494618408704 DeferredSave.addons.json DEBUG Starting timer
1494618408730 addons.manager DEBUG Starting provider: PreviousExperimentProvider
1494618408730 addons.manager DEBUG Registering shutdown blocker for PreviousExperimentProvider
1494618408730 addons.manager DEBUG Provider finished startup: PreviousExperimentProvider
1494618408734 DeferredSave.extensions.json DEBUG Starting write
1494618408749 DeferredSave.extensions.json DEBUG Write succeeded
1494618408757 DeferredSave.addons.json DEBUG Starting write
1494618408937 DeferredSave.addons.json DEBUG Write succeeded
mai 12, 2017 4:46:53 PM org.openqa.selenium.remote.ProtocolHandshake createSession
  
```