



Exploratory Testing Foundations

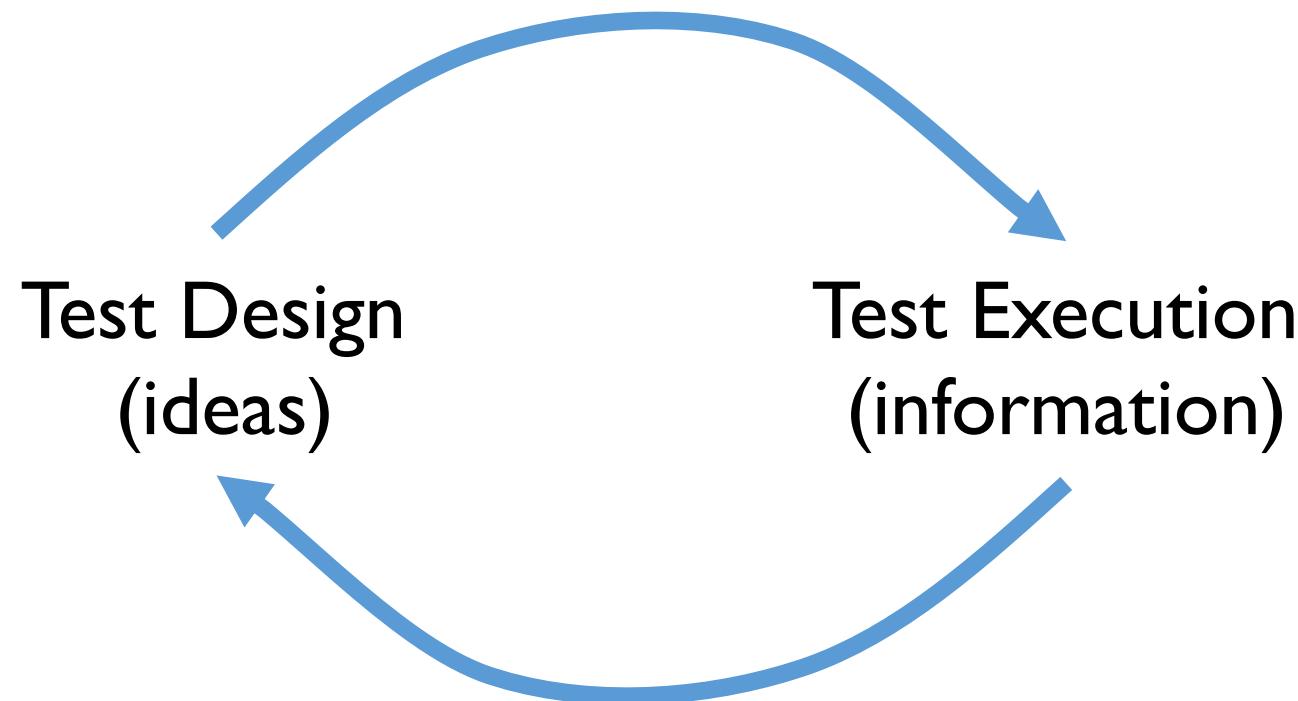
Maaret Pyhäjärvi



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@maaretp

Learning



Exploratory Testing *the Verb*





Input

Tester

Domain knowledge

Requirements and specifications

Testing knowledge

Miscellaneous knowledge



Output

Better tester

Coverage

Information incl. defects and change requests

Documentation: Strategy

Documentation: Tests

Course Outline

Chapter 1: Test target and our options for exploring

Chapter 2: Self-management basics on setting yourself constraints

Chapter 3: The moment of first impression

Chapter 4: Recognizing and learning a domain

Chapter 5: Recognizing functionality

Chapter 6: Recognizing data

Chapter 7: Recognizing application and execution environment

Chapter 8: Documenting in a mindmap

Chapter 9: Robot framework the very basics

Chapter 10: Documenting as skeleton test automation

Chapter 11: Robot framework browser library and CSS selectors on web pages

Chapter 12: Documenting as executable test automation

Chapter 13: Why this is not about Robot Framework

Chapter 14: Use of time

Chapter 15: Coverage

Chapter 16: Test Strategy

Chapter 17: Closing remarks

Test Target and Our Options for Exploring

Chapter I



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✗ Trademark use
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Conditions
① License and copyright notice
② State changes

This test target is from collections of [Alan Richardson](#), [eviltester](#), a brilliant exploratory tester.

E-Primer an e-prime checking tool

Do you want to write without using the verb "to be"?

Do you want to master [e-prime](#)?

Use our online tool to check your writing.

- Word Count:
- Discouraged Words:
- Possible Violations:

Text:



Check For E-Prime



Stop-and-Think: Options for Exploring

What would you do first, and soon after you get started?

List all things that come to your mind about how you could test this. What would you start from? What you would not do?

Options for Exploring

Research the Domain
Use it *with a constraint*

Self-management Basics on Setting Yourself Constraints

Chapter 2



Charters

Charter template

- *target*: where you're exploring
- *resources*: what you're using/how you're exploring
- *information*: what question you want to answer

*Elizabeth Zagroba's concise template adapted
from Elizabeth Hendrickson's template*

Choose Your Own Constraint

Deliberately excluding perspectives!
Never Be Bored!

Explore with Intent

INTENT

Mission

Charter

Other
Charters

Details

LEARNINGS



Stop-and-Think: Charters, Constraints, Intent

You're approaching the moment of first impression. How do you want to frame your moment of first impression?

The Moment of First Impression

Chapter 3



Options Expire

Capture First Impression

Borrow someone else's First Impression

Timing of feedback changes reaction to it!

Let's Test

<https://www.exploratorytestingacademy.com/app/>

<https://eviltester.github.io/TestingApp/apps/eprimer/eprimer.html>

Example: Test Results, Red is Bug



Bugs are Conversation Starters

Bug is anything that might bug a user.
You start conversations about defects and
change requests.

Recognizing and Learning a Domain

Chapter 4



Conference Reference Inference



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- Discouraged Words: 3
- Possible Violations: 1

To **be** or not to **be** is Hamlet's dilemma

Text:

To be or not to be is Hamlet's dilemma

Check For E-Prime

```
function inEPrimeOutputFormat(aWord){  
    return '<span class="ep_violation">' + aWord + "</span>";  
}  
  
function inImpossibleEPrimeOutputFormat(aWord){  
    return '<span class="ep_warning">' + aWord + "</span>";  
}  
  
function isDiscouragedWord(aWord){  
  
    var discouragedWords = new Array();  
    discouragedWords['be'] = 'be';  
    discouragedWords['being'] = 'being';  
    discouragedWords['been'] = 'been';  
    discouragedWords['am'] = 'am';  
    discouragedWords["isn't"] = "isn't";  
    discouragedWords["are"] = "are";  
    discouragedWords["aren't"] = "aren't";  
    discouragedWords["was"] = "was";  
    discouragedWords["wasn't"] = "wasn't";  
    discouragedWords["were"] = "were";  
    discouragedWords["weren't"] = "weren't";  
    discouragedWords["is"] = "is";  
    discouragedWords["ain't"] = "ain't";  
    discouragedWords["i'm"] = "i'm";  
    discouragedWords["amn't"] = "amn't";  
  
    return (discouragedWords[aWord.toLowerCase()] == aWord.toLowerCase());  
}
```

Let's Test

<https://www.exploratorytestingacademy.com/app/>

<https://eviltester.github.io/TestingApp/apps/eprimer/eprimer.html>

Learning of Domain of E-Primer

Core Idea	Writing English language avoiding verb “be” in all its forms
Why?	Someone claims it had benefits, intellectual challenge
Examples	Used in sentences Listed examples
Sample texts	The Bible!

Recognizing Functionality

Chapter 5



Naming of Function

Functions in Code
Expected Features
Visible Features

Let's Test

<https://www.exploratorytestingacademy.com/app/>

<https://eviltester.github.io/TestingApp/apps/eprimer/eprimer.html>

Learning of Function of E-Primer

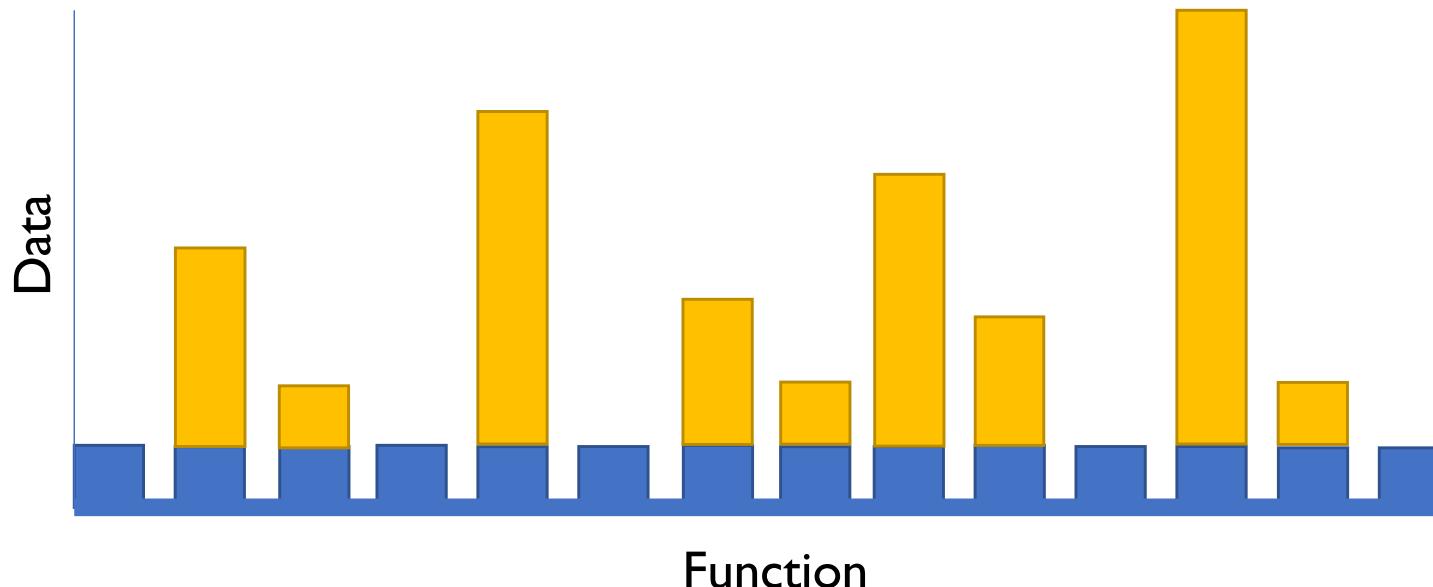
Input	Text field and button
Output	Three numbers, text area
Containers	Resizable text field, resizable browser window, page
Presentation	Fonts, text and element sizes, order of functions
Browser	Settings, zoom
Algorithm	Recognizing eprime

Recognizing Data

Chapter 6



Data or Variables



Versatile Data

Lifecycle of Data: Create, Read, Update,
Delete

Known problematic inputs: GitHub Naughty
Strings

<https://github.com/minimaxir/big-list-of-naughty-strings/blob/master/blns.txt>

Let's Test

<https://www.exploratorytestingacademy.com/app/>

<https://eviltester.github.io/TestingApp/apps/eprimer/eprimer.html>

Learning of Data of E-Primer

Word delimiter	Space, wordcount breaks with characters and line change
Types of apostrophes	Typesetter / typewriter
Long text	Copied / tool generated
Valid eprime	Recognizing right as right
Eprime violations	Recognizing wrong as wrong

Recognizing Application and Execution Environment

Chapter 7



What You Coded is a Bad Constraint



Naomi Wu 机械妖姬
@RealSexyCyborg

...

You can't say "Signal is secure, it's the OS that's not" if Signal cannot operate without an OS. They are a system - can only be used as a system, they need to be evaluated as a system, and their effectiveness as a system disclosed to customers.

3:58 AM · Jan 16, 2021 · Twitter Web App

Execution Environment

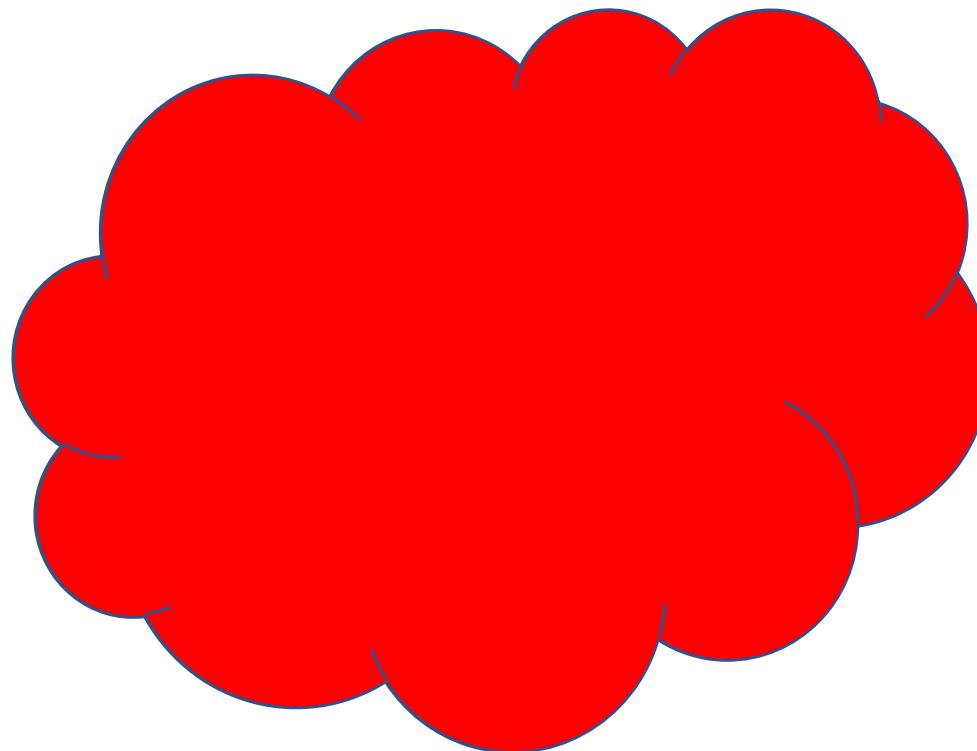
Different browsers: web and mobile
Browser functionality and add-ons
HTML standard compatibility
Accessibility standard compatibility

Let's Test

<https://www.exploratorytestingacademy.com/app/>

<https://eviltester.github.io/TestingApp/apps/eprimer/eprimer.html>

Learning of Application and Execution Environment of E-Primer

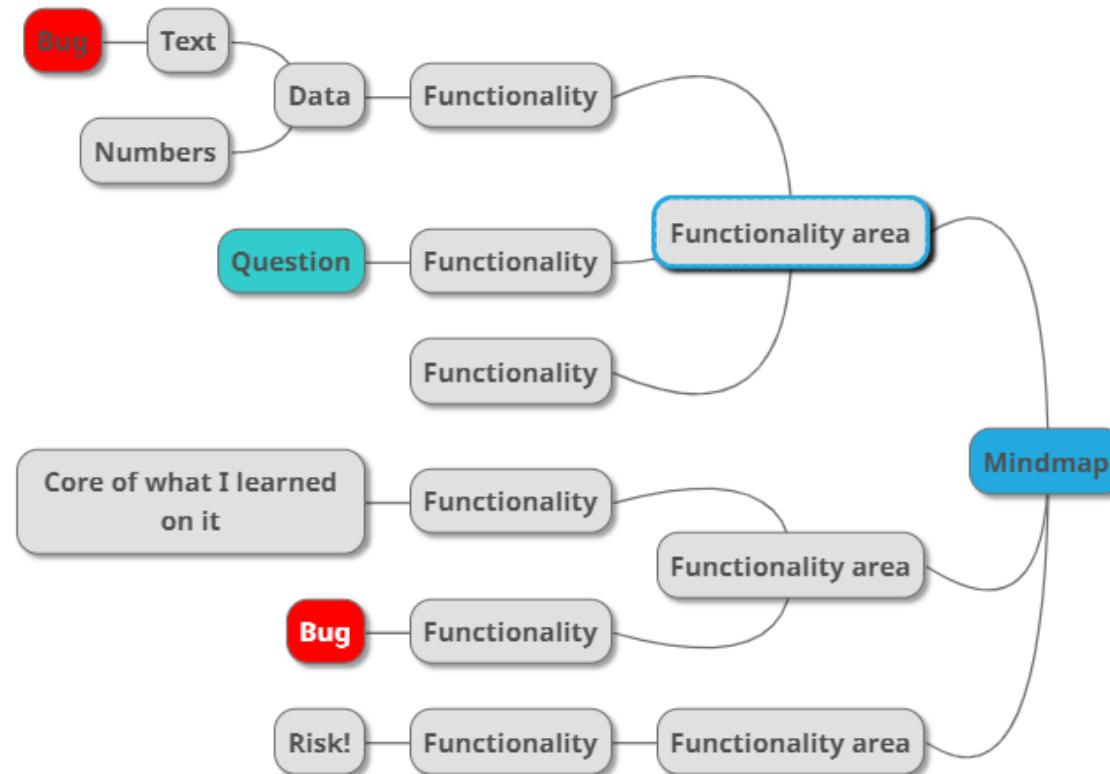


Documenting in a Mindmap

Chapter 8



Mindmap



Cem Kaner. Bug Reporting Heuristic.

Bug Reporting

R eplicate
e solate
m azimize
e neralize
x ternalize
n eutral tone

Let's Test

<https://www.exploratorytestingacademy.com/app/>

<https://eviltester.github.io/TestingApp/apps/eprimer/eprimer.html>

Mindmapping as Future Reference

Notetaking in the moment

Restructure as you learn

Documentation for the future

General purpose mindmaps

Robot Framework the Very Basics

Chapter 9



Robot Framework

Custom-made language

Built-in reporting

Ecosystem of keyword libraries

Documenting as Skeleton Test Automation

Chapter 10



Log

```
1  *** Test Cases ***
2  This is a test case name
3      Log      First thing to do
4      Log      Second thing to do
5      Log      Third thing to do
```

```
=====
Basic
=====
This is a test case name | PASS |
-----
Basic | PASS |
1 critical test, 1 passed, 0 failed
1 test total, 1 passed, 0 failed
=====
```

Let's Test

<https://www.exploratorytestingacademy.com/app/>

<https://eviltester.github.io/TestingApp/apps/eprimer/eprimer.html>

Skeleton Test Automation

Stepwise Test Cases as
Automation Placeholders

Like test cases but version
controlled as code

Handoff to a task that is
decomposing testing
differently

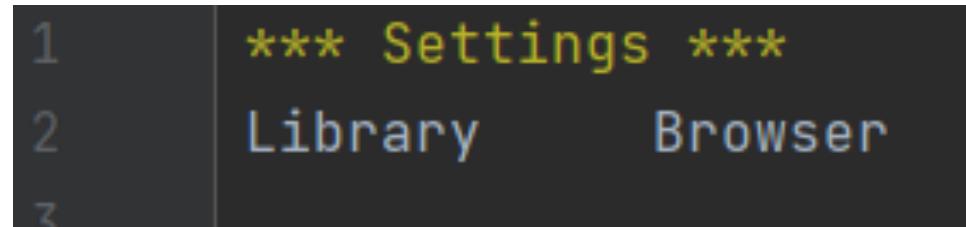
Robot Framework Browser Library and css selectors on Web Page

Chapter 11



Browser Library

Playwright inside
Speed – Reliability – Visibility
Automatic waits



css selectors

css=

#id

.class

tag

[attribute='value']

[part_of_attribute_value_contains*='value']

Keywords

```
1  *** Settings ***
2  Library      Browser
3
4  *** Test Cases ***
5  Open the Page Headless
6    New Page     https://www.exploratorytestingacademy.com/app/
```

<https://marketsquare.github.io/robotframework-browser/RobotFrameworkBrowser.html>

Documenting as Executable Test Automation

Chapter 12



Let's Test

<https://www.exploratorytestingacademy.com/app/>

<https://eviltester.github.io/TestingApp/apps/eprimer/eprimer.html>

```
1  *** Settings ***
2  Library          Browser
3  Test Setup       Default Setup
4  Test Teardown    Default Teardown
5
6  *** Variables ***
7  ${URL}           https://www.exploratorytestingacademy.com/app/
8  ${input text}     To be or not to be is Hamlet's dilemma
9  ${word count}    9
10 ${discouraged count} 3
11
12 *** Test Cases ***
13
14 Verify Word Text
15   New Page    ${URL}
16   Fill Text    css=#inputtext  ${input text}
17   Click        css=#CheckForEPrimeButton
18   Get Text     css=#eprimeoutput == ${input text}
19   Get Text     css=#wordCount    == ${word count}
20   Get Text     css=#discouragedWordCount == ${discouraged count}
21
22 *** Keywords ***
23 Default Setup
24   New Browser      chromium      headless=${FALSE}
25
26 Default Teardown
27   Close Browser
```



firstTest Log

Generated
2021/02/02 21:16:15 UTC+02:00
22 seconds ago

Test Statistics

Total Statistics		Total	Pass	Fail	Elapsed	Pass / Fail
Critical Tests		1	1	0	00:00:03	<div style="width: 100%; background-color: green;"></div>
All Tests		1	1	0	00:00:03	<div style="width: 100%; background-color: green;"></div>
Statistics by Tag						
No Tags						<div style="width: 0%; background-color: lightgray;"></div>
Statistics by Suite						
firstTest		1	1	0	00:00:04	<div style="width: 100%; background-color: green;"></div>

Test Execution Log

- SUITE firstTest	00:00:03.523
Full Name:	firstTest
Source:	C:\BitbucketRepos\localBrowserCoiote\leprime\firstTest.robot
Start / End / Elapsed:	2021/02/02 21:16:11.775 / 2021/02/02 21:16:15.298 / 00:00:03.523
Status:	1 critical test, 1 passed, 0 failed 1 test total, 1 passed, 0 failed
- TEST Verify Word Text	00:00:02.642
Full Name:	firstTest.Verify Word Text
Start / End / Elapsed:	2021/02/02 21:16:12.650 / 2021/02/02 21:16:15.292 / 00:00:02.642
Status:	PASS (critical)
+ SETUP Default Setup	00:00:00.613
+ KEYWORD Browser.New Page \${URL}	00:00:01.703
+ KEYWORD Browser.Fill Text css=#inputtext, \${input text}	00:00:00.036
+ KEYWORD Browser.Click css=#CheckForEPrimeButton	00:00:00.049
+ KEYWORD Browser.Get Text css=#eprimeoutput, ==, \${input text}	00:00:00.026
+ KEYWORD Browser.Get Text css=#wordCount, ==, \${word count}	00:00:00.015
+ KEYWORD Browser.Get Text css=#discouragedWordCount, ==, \${discouraged count}	00:00:00.014
+ TEARDOWN Default Teardown	00:00:00.160

```
1  *** Settings ***
2  Library      Browser
3  Test Setup      Default Setup
4  Test Teardown    Default Teardown
5  Test Template    Verify Word Text
6
7  *** Variables ***
8  ${URL}      https://www.exploratorytestingacademy.com/app/
9
10 *** Test Cases ***
11 Test1  nothing  1  0
12 Test2  to be or not to be  6  2
13 Test3  The cat is my only pet  6  1
14 Test4  The cat is Garfield  4  1
15 Test5  be, being, been, am, is, isn't, are, aren't, was, wasn't, were, and weren't.  13  12
16 Test6  I'm, you're, we're, they're, he's, she's, it's, there's, here's, where's, how's, what's, who's, aint's, that's.  15  15
17 Test7  ${EMPTY}  0  0
18
19 *** Keywords ***
20 Verify Word Text
21     [Arguments]  ${input text}  ${word count}  ${discouraged count}
22     New Page  ${URL}
23     Fill Text  css=#inputtext  ${input text}
24     Click  css=#CheckForEPrimeButton
25     Get Text  css=#eprimeoutput  ==  ${input text}
26     Get Text  css=#wordCount  ==  ${word count}
27     Get Text  css=#discouragedWordCount  ==  ${discouraged count}
28
29 Default Setup
30     New Browser  chromium  headless=${FALSE}
31
32 Default Teardown
33     Close Browser
```

TEST		REPORT
Source:	C:\BitbucketRepos\localBrowserCoiote\prime\test.robot	
Start / End / Elapsed:	20210123 19:00:35.362 / 20210123 19:01:09.799 / 00:00:34.437	
Status:	7 critical test, 6 passed, 1 failed	
	7 test total, 6 passed, 1 failed	
+ TEST Test1		00:00:09.916
+ TEST Test2		00:00:03.287
+ TEST Test3		00:00:03.089
+ TEST Test4		00:00:03.193
+ TEST Test5		00:00:03.312
- TEST Test6		00:00:04.722
Full Name:	Test.Test6	
Start / End / Elapsed:	20210123 19:01:01.441 / 20210123 19:01:06.163 / 00:00:04.722	
Status:	FAIL (critical)	
Message:	Property innerText '1' (str) should be '15' (str)	
+ SETUP Default Setup		00:00:00.961
- KEYWORD Verify Word Text I'm, you're, we're, they're, he's, she's, it's, there's, here's, where's, how's, what's, who's, aint's, that's., 15, 15		00:00:03.276
Start / End / Elapsed:	20210123 19:01:02.417 / 20210123 19:01:05.693 / 00:00:03.276	
+ KEYWORD Browser.New Page \${URL}		00:00:01.622
+ KEYWORD Browser.Fill Text css=#inputtext, \${input text}		00:00:00.054
+ KEYWORD Browser.Click css=#CheckForEPrimeButton		00:00:00.053
+ KEYWORD Browser.Get Text css=#eprimeoutput, ==, \${input text}		00:00:00.024
+ KEYWORD Browser.Get Text css=#wordCount, ==, \${word count}		00:00:00.023
- KEYWORD Browser.Get Text css=#discouragedWordCount, ==, \${discouraged count}		00:00:01.495
Documentation:	Returns text attribute of the element found by <code>selector</code> . See the 'Finding elements' section for details about the selectors.	
Tags:	Assertion, Getter, PageContent	
Start / End / Elapsed:	20210123 19:01:04.198 / 20210123 19:01:05.693 / 00:00:01.495	
19:01:05.575 INFO		
		
19:01:05.693 FAIL	Property innerText '1' (str) should be '15' (str)	
+ TEARDOWN Default Teardown		00:00:00.468
+ TEST Test7		00:00:03.620

Documenting as Executable Test Automation

- Single line
 - See it fail
 - First test
 - Same test but variables
 - Same test but templates
 - **Failing test with a bug**
 - Spec to tests
 - Guess the values that are likely to fail
 - Multiple browsers
 - Runs in CI

Throwaway automation?

Why This is not about Robot Framework

Chapter 13



Documentation as a Constraint

A Balancing Act between Now and Future
Never be bored is not possible without
automation

Automation in Frame of Exploratory testing



Documenting



Extending reach



Alerting to attend



Guiding to detail



Stop-and-Think: Robot Framework Browser

How would the testing you did before this have been different if you were to start with this?

Use of Time

Chapter 14



Test, Bug, Setup

Software with little bugs is faster to test
Setup is configuring, learning and
documenting
Test grows coverage

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to be or not to be - hamlet's dilemma

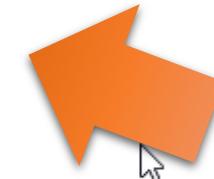
Text:

to be or not to be - hamlet's dilemma

Check For E-Prime

Test Cases
trap

Bug trap



Algorithm
trap



Stop-and-Think: Time and Traps

**Where did your time go on testing of
the application?**

Coverage

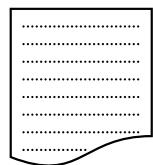
Chapter 15



Setting the Stage for Testing

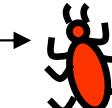
WHAT
WHEN
WHO
HOW
WHY

We target
these...



Test ideas

...to find
these...



Serious

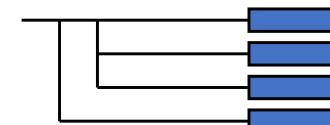
B business

PM project (time)

T testing (time)

U user

...to tell if there's
more and what
level we know
things.



Coverage

REQUIREMENTS
RISKS (of relevant bugs)
CODE
ENVIRONMENTS

Risk Coverage

Coverage of relevant bugs

Effectiveness – results of overall strategy
facilitate experience of quality for
stakeholders

Stop-and-Think: Coverage of Today's Testing

Would the testing you thought of have missed any of the bugs we have seen?

What did we not test?

Test Strategy

Chapter 16



Ideas that Guide Test Design

Specific to Application Under Test
Risks to ways of testing for them

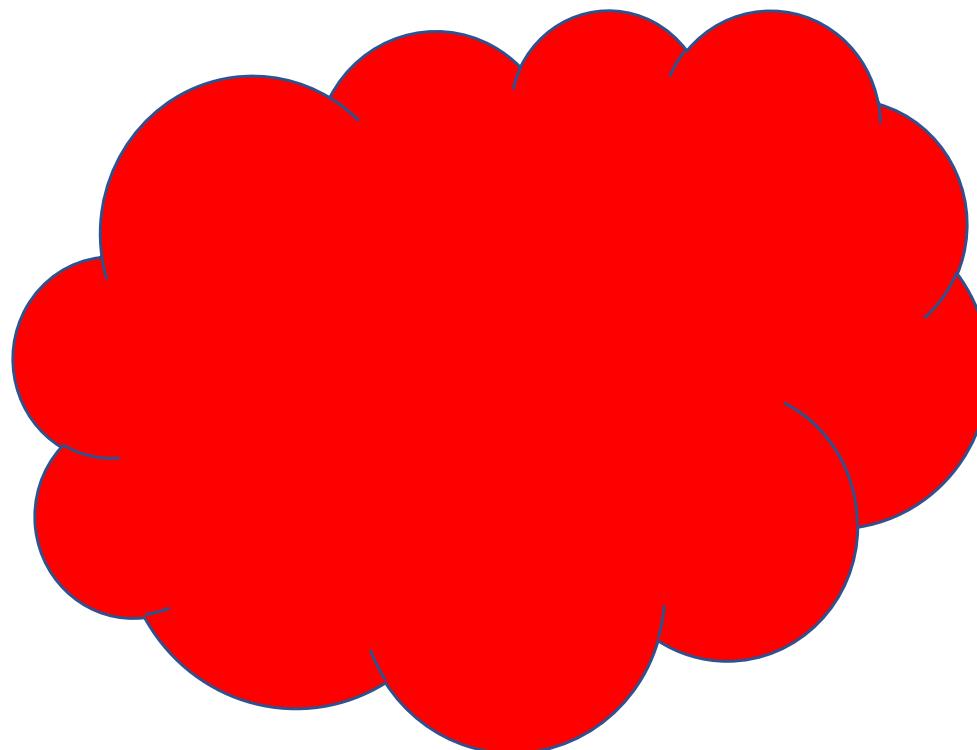
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<https://www.exploratorytestingacademy.com/app/>

<https://eviltester.github.io/TestingApp/apps/eprimer/eprimer.html>

Test Strategy for E-Primer

...



Closing Remarks

Chapter 17



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2020

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Web: maaretp.com

Blog: visible-quality.blogspot.fi

(please connect with me through Twitter or LinkedIn)



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