CS 1632 – DELIVERABLE 3: Unit Testing

By Josh Koshy

GitHub: https://github.com/Josh-Koshy/CS1632\_Deliverable3.git

Introduction

Getting the programs to work properly in the first place was a huge pain. Selenium is not kind. Getting the jar files to work was especially tiring, but I managed to get through it. I could get my bearings and start to test code properly. Figuring out how to properly utilize the library to find attributes and texts was daunting, but it was something I could get better at after practice. Learning the documents for Selenium helped tremendously, and I could find what I needed eventually. In the end, there were minor typos that broke some tests. Because of this, I assumed some defects were true until I tested them. Afterwards, I realized my errors in my code and I could fix them promptly.

I did realize, to my frustration, that a huge amount of the Fibonacci inputs were not working. However, I already wrote the tests beforehand. I knew testing the edge cases would account for this, but the severity of the issue is certainly undermined. Next time, I would certainly write tests to test more numbers within portions of the range of inputs, but I don’t know under what reasoning I would say these tests are for. This is a part where I would think manual testing would be much more preferred, but I do see tremendous value in automation here in testing. If it weren’t for learning the documentation for Selenium, along with the other struggles, I think this would have been very fast to test.

**Traceability Matrix**

Requirement 1: testDisplayText1, testDisplayText2

Requirement 2: testHomepageHasCorrectHeaders, testFibonacciHasCorrectHeaders, testFactorialHasCorrectHeaders, testHelloHasCorrectHeaders, testCathedralHasCorrectHeaders

Requirement 3: testPositiveIntegerInput, testLowerBoundaryInput, testUpperBoundaryInput

Requirement 4: testPositiveIntegerInput, testLowerBoundaryInput2, testUpperBoundaryInput2

Requirement 5: testNegativeIntegerInput, testNegativeIntegerInput2, testLowerBoundaryInput, testLowerBoundaryInput2, testUpperBoundaryInput, testUpperBoundaryInput2, testOutOfRange, testOutOfRange2, testTextInput, testTextInput2, testDecimalInput, testDecimalInput2, testNoInput, testNoInput2

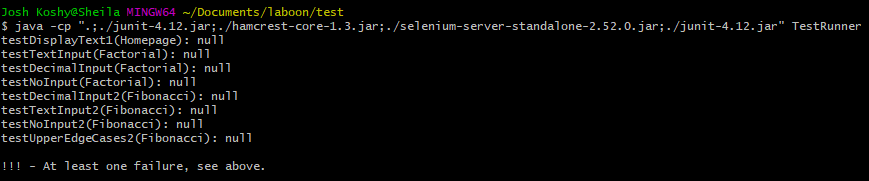
Requirement 6: testDefaultTrailingUrl

Requirement 7: testCustomTrailingUrl

Requirement 8: testPicturesExist, testCathedralHasCorrectHeaders

\* In testing the edge cases for this program, I found that I was testing both valid and invalid inputs to both the Fibonacci and Factorial pages. This is covered in multiple pairings of requirements. I marked these tests in the traceability matrix to show that they were repeated when they were utilized in another requirement.

**Defects**



SUMMARY: Entering a string value as input on the Factorial page does not show a “1” as the result and shows irrelevant text instead to the user.

DESCRIPTION: When entering a string value as input on the Factorial page, the page changes to a white screen with the text “Internal server error” displayed.

REPRODUCTION STEPS:

1. Open the web page <https://cs1632ex.herokuapp.com/>
2. Click the Factorial tab in the header
3. Enter any valid string value (anything that isn’t a valid number or decimal number)
4. Click Submit

EXPECTED BEHAVIOR: The user should be informed that the Factorial value is 1.

OBSERVED BEHAVIOR: The user is displayed text stating “Internal server error”.

SEVERITY: Minor

IMPACT: The user might think there is a problem with the site and may not attribute the error to the inputted string. This, however, will not affect the performance of the Factorial tool, as this is caused by uncommon user input.

SUMMARY: Entering a decimal value as input on the Factorial page does not show a “1” as the result and shows irrelevant text instead to the user.

DESCRIPTION: When entering a decimal value as input on the Factorial page, the page changes to a white screen with the text “Internal server error” displayed.

REPRODUCTION STEPS:

1. Open the web page <https://cs1632ex.herokuapp.com/>
2. Click the Factorial tab in the header
3. Enter any valid decimal number
4. Click Submit

EXPECTED BEHAVIOR: The user should be informed that the Factorial value is 1.

OBSERVED BEHAVIOR: The user is displayed text stating “Internal server error”.

SEVERITY: Minor

IMPACT: The user might think there is a problem with the site and may not attribute the error to the inputted decimal. This, however, will not affect the performance of the Factorial tool, as this is caused by uncommon user input. However, it is important to note that 2.0 is a decimal number, as well as a valid integer and because of this, it should be returning its corresponding Factorial number. Any decimal number that only has zeroes after the decimal point should be a valid integer as long as the number is between 1 and 100.

SUMMARY: Entering no value as input on the Factorial page does not show a “1” as the result and shows irrelevant text instead to the user.

DESCRIPTION: When entering no value as input on the Factorial page, the page changes to a white screen with the text “Internal server error” displayed.

REPRODUCTION STEPS:

1. Open the web page <https://cs1632ex.herokuapp.com/>
2. Click the Factorial tab in the header
3. Enter any valid decimal number
4. Click Submit

EXPECTED BEHAVIOR: The user should be informed that the Factorial value is 1.

OBSERVED BEHAVIOR: The user is displayed text stating “Internal server error”.

SEVERITY: Minor

IMPACT: The user might think there is a problem with the site and may not attribute the error to there not being any input. This, however, will not affect the performance of the Factorial tool, as this is caused by uncommon user input.

SUMMARY: Entering a string value as input on the Fibonnaci page does not show a “1” as the result and shows irrelevant text instead to the user.

DESCRIPTION: When entering a string value as input on the Fibonnaci page, the page changes to a white screen with the text “Internal server error” displayed.

REPRODUCTION STEPS:

1. Open the web page <https://cs1632ex.herokuapp.com/>
2. Click the Fibonacci tab in the header
3. Enter any valid string value (anything that isn’t a valid number or decimal number)
4. Click Submit

EXPECTED BEHAVIOR: The user should be informed that the Fibonnaci value is 1.

OBSERVED BEHAVIOR: The user is displayed text stating “Internal server error”.

SEVERITY: Minor

IMPACT: The user might think there is a problem with the site and may not attribute the error to the inputted string. This, however, will not affect the performance of the Fibonnaci tool, as this is caused by uncommon user input.

SUMMARY: Entering a decimal value as input on the Fibonnaci page does not show a “1” as the result and shows irrelevant text instead to the user.

DESCRIPTION: When entering a decimal value as input on the Fibonnaci page, the page changes to a white screen with the text “Internal server error” displayed.

REPRODUCTION STEPS:

1. Open the web page <https://cs1632ex.herokuapp.com/>
2. Click the Fibonnaci tab in the header
3. Enter any valid decimal number
4. Click Submit

EXPECTED BEHAVIOR: The user should be informed that the Fibonnaci value is 1.

OBSERVED BEHAVIOR: The user is displayed text stating “Internal server error”.

SEVERITY: Minor

IMPACT: The user might think there is a problem with the site and may not attribute the error to the inputted decimal. This, however, will not affect the performance of the Fibonnaci tool, as this is caused by uncommon user input. However, it is important to note that 2.0 is a decimal number, as well as a valid integer and because of this, it should be returning its corresponding Factorial number. Any decimal number that only has zeroes after the decimal point should be a valid integer if the number is between 1 and 100.

SUMMARY: Entering no value as input on the Fibonnaci page does not show a “1” as the result and shows irrelevant text instead to the user.

DESCRIPTION: When entering no value as input on the Fibonnaci page, the page changes to a white screen with the text “Internal server error” displayed.

REPRODUCTION STEPS:

1. Open the web page <https://cs1632ex.herokuapp.com/>
2. Click the Fibonnaci tab in the header
3. Enter any valid decimal number
4. Click Submit

EXPECTED BEHAVIOR: The user should be informed that the Fibonnaci value is 1.

OBSERVED BEHAVIOR: The user is displayed text stating “Internal server error”.

SEVERITY: Minor

IMPACT: The user might think there is a problem with the site and may not attribute the error to there not being any input. This, however, will not affect the performance of the Fibonnaci tool, as this is caused by uncommon user input.

SUMMARY: Entering the number 100 as input on the Fibonnaci page does not yield the Fibonnaci value of 100 and shows the value to be “1” instead.

DESCRIPTION: When entering 100 as input on the Fibonnaci page, the page will display the wrong Fibonacci value for the value 100, stating that the Fibonnaci value is 1. 100 is within the range of working integers that should work as input on this page, and should be displaying it’s correct Fibonnaci value instead.

REPRODUCTION STEPS:

1. Open the web page <https://cs1632ex.herokuapp.com/>
2. Click the Fibonnaci tab in the header
3. Enter 100
4. Click Submit

EXPECTED BEHAVIOR: The user should be shown the text: Fibonnaci of 100 is 354224848179261915075!

OBSERVED BEHAVIOR: The user is shown: Fibonnaci of 100 is 1!

SEVERITY: Normal

IMPACT: The user may look up the Fibonnaci value of 100 and get the wrong value instead. This affects the performance of the software. Though this user input value is uncommon and a specific case, it is an entirely valid input that should expect a valid result in return.

*Note: I decided to not list the “testDisplayText1” test as a defect, mainly because viewing the page myself did not show that there was any error at all. I’m not sure what is prompting this error, but the user is seeing the text that is required to be seen by the requirement. This may be a technical error with the page that is not visible to us.*