CS 1632 Software Quality Assurance

Exercise 1

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1. Introduction

a. One Edge Case

Provide the IDENTIFIER of an edge case that you tested. Explain why this is an edge case.

Identifier: TEST-ARGS-NUMBER-TIMES-100. This is an edge case because it is a boundary value for the recommended minimum times to run the system.

b. One Corner Case

Provide the IDENTIFIER of a corner case that you tested. Explain why this is a corner case.

Identifier: TEST-ARGS-NUMBER-THREADS-NEG -> This is a corner case because -3 is very far from the normal operating parameters for the number of threads parameter. You can't have a negative amount of threads.

1.   Traceability Matrix

Write your traceability matrix here.

FUN-ARGS-NUMBER: TEST-ARGS-NUMBER-ARGUMENTS

FUN-ARGS-INVALID: TEST-ARGS-CHAR-FOR-THREADS

FUN-DISPLAY-RESULTS: TEST-ARGS-RESULTS-DISPLAY

FUN-DISPLAY-ITERATIONS: TEST-SUM-OF-ITERATIONS

FUN-SMALL-NUM: TEST-ARGS-NUMBER-TIMES-100, TEST-ARGS-NUMBER-TIMES-99

1.   **Test Cases**

Write your test cases here.

IDENTIFIER: TEST-ARGS-NUMBER-ARGUMENTS

TEST CASE: When running the GoatGoatCar.jar file, the user will pass in only three arguments: good option, bad option, and number of times

PRECONDITIONS:

- Type "Java -version" in the command line and make sure it returns "java version "1.8.0_231"
- Ensure you are in the directory that has the GoatGoatCar.jar file

EXECUTION STEPS:

- Type "java -jar GoatGoatCar.jar car goat 10001 " into the command line and press enter

POSTCONDITIONS: The system will display the usage information for the program and shut down.

IDENTIFIER: TEST-ARGS-CHAR-FOR-THREADS

TEST CASE: The user passes 'b', a char, for the number of threads on the command line when running the file GoatGoatCar.jar

PRECONDITIONS: "Java -version" on the command line results in the output "java version "1.8.0_231" or newer', enter the directory where GoatGoatCar.jar is found via command line

EXECUTION STEPS:

1. On the command line, enter "java -jar GoatGoatCar.jar car goat 10001 b".
2. Run the program on the command line

POSTCONDITIONS: After performing the execution steps, the system explains the reason that it cannot run and shuts down.

IDENTIFIER: TEST-ARGS-RESULTS-DISPLAY

TEST CASE: When running the GoatGoatCar.jar, the user passes "aaa111222bbb" for the good option, "cc3344dd" for the bad option, 6521 for the number of times, and 7 for the number of threads.

PRECONDITIONS:

- Type "Java -version" in the command line and make sure it returns "java version "1.8.0_231"
- Ensure you are in the directory that has the GoatGoatCar.jar file

EXECUTION STEPS:

- "Type "java -jar GoatGoatCar.jar aaa111222bbb cc3344dd 6521 7" into the command line and press enter"

POSTCONDITIONS:

- The system will display the results of the Monty Hall simulation to the user, using percentages with up to three places after the decimal, and then stop execution. This display must print out "aaa111222bbb" for the good option and "cc3344dd" for the bad option.

IDENTIFIER: TEST-SUM-OF-ITERATIONS

TEST CASE: The user passes the inputs 200 for number of times and 3 for number of threads on the command line when running the file GoatGoatCar.jar

PRECONDITIONS: "Java -version" on the command line results in the output "java version "1.8.0_231" or newer', enter directory where GoatGoatCar.jar is found via command line

EXECUTION STEPS:

- On the command line, enter "java -jar GoatGoatCar.jar car goat 10001 b".
- Run the program on the command line

POSTCONDITIONS: The system shall display the number of iterations executed by each thread, which is 67 by thread 0, 67 by thread 1, and 66 by thread 2. There are as many threads as specified in the arguments. The sum of the number of iterations is equal to the number of times specified in the arguments. It is off by at most 1 since the number of times is not a multiple of the number of threads.

IDENTIFIER: TEST-ARGS-NUMBER-TIMES-100

TEST CASE: When executing the GoatGoatCar.jar file, the user passes in "car" for the good option, "goat" for the bad option, 100 for the "number of times" argument, and 4 for the "number of threads" argument.

PRECONDITIONS:
- Type "Java -version" in the command line and make sure it returns "java version "1.8.0_231"
- Ensure you are in the directory that has the GoatGoatCar.jar file

EXECUTION STEPS:
- On the command line, type "java -jar GoatGoatCar.jar car goat 100 4" and press enter

POSTCONDITIONS:
- The number of times is 100, and the minimum is 100. The system should not issue a warning it should proceed normally and display the results of the Monty Hall simulation.

IDENTIFIER: TEST-ARGS-NUMBER-TIMES-99

TEST CASE: When running the GoatGoatCar.jar file, the user passes the number 99 for the argument "number of times"

PRECONDITIONS: "Java -version" on the command line results in the output "java version "1.8.0_231" or newer', enter the directory where GoatGoatCar.jar is found via command line

EXECUTION STEPS:
1. On the command line, enter "java -jar GoatGoatCar.jar car goat 99 10".
2. Run the program on the command line

POSTCONDITIONS: Since the "number of times" argument is less than 100, the system will issue a warning and ask the user if they wish to continue.

IDENTIFIER: TEST-ARGS-NUMBER-THREADS-NEG

TEST CASE: When executing the GoatGoatCar.jar file, the user passes in "car" for the good option, "goat" for the bad option, 3000 for the "number of times" argument, and -3 for the "number of threads" argument.

PRECONDITIONS:
- Type "Java -version" in the command line and make sure it returns "java version "1.8.0_231"
- Ensure you are in the directory that has the GoatGoatCar.jar file

EXECUTION STEPS:
- On the command line, type "java -jar GoatGoatCar.jar car goat 3000 -3" and press enter

POSTCONDITIONS:
- The number of threads argument is not a positive integer, so it should display to the user "<num_threads> must be an integer greater than 0."

1. **Defects**

Write your defects here.

IDENTIFIER: BUG-ARGS-CHAR-FOR-THREADS
SUMMARY:When a non-integer value is placed on the command line for the number of times, the system displays a java exception
DESCRIPTION: When a non-integer value is placed on the command line, such as the char 'b' in this test, in place of the number of times, the system displays a java exception. Specifically, the system outputs a NumberFormatException.
REPRODUCTION STEPS:
1. "Java -version" on the command line results in the output "java version "1.8.0_231" or newer'
2. Enter directory where GoatGoatCar.jar is found via command line
3. On the command line, enter "java -jar GoatGoatCar.jar car goat 10001 b".
4. Run the program on the command line

EXPECTED BEHAVIOR: After performing the execution steps, the system explains the reason that it cannot run and shuts down.
OBSERVED BEHAVIOR: After performing the execution steps, the system displays a java exception

IDENTIFIER: BUGS-ARGS-CORNER-100-ARGS
SUMMARY: When the "number of trials" is the minimum value, the system displays a warning.
DESCRIPTION: When putting 100 as the "number of trials" input, the system displays a warning to the user stating that 100 is the recommended minimum value. The minimum value displays a warning.
REPRODUCTION STEPS:
1. Type "Java -version" in the command line and make sure it returns "java version "1.8.0_231"
2. Ensure you are in the directory that has the GoatGoatCar.jar file
3. On the command line, type "java -jar GoatGoatCar.jar car goat 100 4" and press enter
EXPECTED BEHAVIOR:
The system should proceed normally and display the results of the Monty Hall simulation.

OBSERVED BEHAVIOR: The system displayed a warning saying:

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Recommended minimum number of times is 100
Continue? [y/n] >
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