

**CS 1632 Software Quality Assurance**

**Exercise 1**

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1. **Traceability Matrix**

**FUN-ARGS-NUMBER**: THREE\_ARGS\_REASON,

**FUN\_ARGS\_INVALID**: NEGATIVE\_ARGS\_REASON, NAN\_ARG\_REASON

**FUN-DISPLAY-RESULTS**: FLOAT\_PRECISION\_TEST

**FUN-DISPLAY-ITERATIONS**: EQUAL\_ITER\_TEST

**FUN-SMALL-NUM**: LESS\_THAN\_HUNDRED\_WARNING

1. **Test Cases**

THREE\_ARGS\_REASON:

Test Case: Testing to see if less than 4 arguments are accepted by the program.

Preconditions: When "java -ver" is typed into the command line, "java version "1.8.0\_231" is output to the command line.

Execution Steps: Open a command line terminal and type "java -jar GoatGoatCar.jar Goat Car 1000 " and press enter.

Postconditions: The system displays the usage information and exits.

NEGATIVE\_ARGS\_REASON:

Test Case: Testing to see if negative arguments are accepted by the program.

Preconditions: When "java -ver" is typed into the command line, "java version "1.8.0\_231" is output to the command line.

Execution Steps: Open a command line terminal and type "java -jar GoatGoatCar.jar Goat Car 1000 -4" and press enter.

Postconditions: The system displays "<num\_threads> must be an integer greater than 0." then exits.

FLOAT\_PRECISION\_TEST:

Test Case: Testing to see if the floating-point precision of the probabilities is to 3 places after the decimal.

Preconditions: When "java -ver" is typed into the command line, "java version "1.8.0\_231" is output to the command line.

Execution Steps: Open a command line terminal and type "java -jar GoatGoatCar.jar Goat Car 1000 4" and press enter.

Postconditions: the system displays the probability of car under "Switch:" as "67.000%" and the system displays the probability of goat under "Stay" as "67.000%"

EQUAL\_ITER\_TEST:

Test Case: Testing to see if an equal number of iterations are done over all threads.

Preconditions: When "java -ver" is typed into the command line, "java version "1.8.0\_231" is output to the command line.

Execution Steps: Open a command line terminal and type "java -jar GoatGoatCar.jar Goat Car 1000 4" and press enter.

Postconditions: the system displays "250 iterations" after "Thread 0: ", "Thread 1:", "Thread 2: ", and "Thread: 3"

LESS\_THAN\_HUNDRED\_WARNING:

Test Case: Testing if program gives warning when less than 100 iterations is requested.

Preconditions: When "java -ver" is typed into the command line, "java version "1.8.0\_231" is output to the command line.

Execution Steps: Open a command line terminal and type "java -jar GoatGoatCar.jar Goat Car 10 4" and press enter.

Postconditions: the system displays warning that the number is too low and ask user if they wish to continue.

NAN\_ARG\_REASON:

Test Case: Testing if the system provides proper reason for failure and then exits

Preconditions: When "java -ver" is typed into the command line, "java version "1.8.0\_231" is output to the command line.

Execution Steps: Open a command line terminal and type "java -jar GoatGoatCar.jar Goat Car yeet 4"

Postconditions: the system displays reason for the failure and exits.

1. **Defects**

Write your defects here.

IDENTIFIER: LESS\_THAN\_ONE\_HUNDRED\_ITERATIONS\_WARNING\_FAILURE

SUMMARY: The warning for less than 100 number of times should only appear when the number of times entered are less than 100, but the warning will show up when there are exactly 100 times.

DESCRIPTION: Upon entering 100 for the number of times argument on the command line, the user will be asked if they want to continue even though 100 is the smallest recommended number of times. They should not be asked this if 100 meets the requirements.

REPRODUCTION STEPS: Preconditions are to open a command prompt and cd to the correct directory the program is stored in. Next type in “-jar GoatGoatCar.jar Car Goat 100 10” and press enter.

EXPECTED BEHAVIOR: The program was expected to display the statistics of the Monty hall problem.

OBSERVED BEHAVIOR: The user is shown the message “Recommended minimum number of times is 100”

IDENTIFIER: HIGH\_NUMBER\_OF\_TIMES\_FAILURE

SUMMARY: Entering a high number of times causes a warning that does not make sense.

DESCRIPTION: When the user enters a very large number as the number of times argument they are greeted with a warning that says the number of times argument must be greater than zero even though what they entered was greater than zero.

REPRODUCTION STEPS: Preconditions are to open a command prompt and cd to the correct directory the program is stored in. Next type in “java -jar GoatGoatCar.jar Car Goat 10000000000 4” and press enter.

EXPECTED BEHAVIOR: The program was expected to display the statistics of the Monty hall problem.

OBSERVED BEHAVIOR: The user is shown the message ““<num\_times> must be an integer greater than 0.”