Project Name: Homework 4

Unit Test Case Specification

Test Case ID: UnitTestingHomework_TC_2

Test Designed by: Tanner Huynh

Test Priority (Low/Medium/High): Low

Test Designed date: November 6, 2019

Module Name: UnitTestingHomework

Test Title: Factorial Method Test

Description: Test the method factorial which multiplies all whole numbers from the chosen number down to 1. Per the interface: int factorial(int n).

Pre-conditions: N/A

Dependencies: N/A

Case	Given Input	Expected Result	Notes/Environment
1	0	1	Integer value at lower boundary
2	1	1	Next to boundary on the positive case side
3	-1	IllegalArgument-Exception	Next to boundary on the negative case side
4	8	40320	Partition boundary defined on input space.

5	7	`5040`	Left edge of partition boundary defined on input space.
6	15	`2004310016`	Left edge of range for second partition.
7	16	`2004189184`	Left edge of range for second partition - 1.

Post Conditions: N/A

Explanation:
The range of valid inputs for this function, `public int factorial(int n),` is [`0…16`] for all whole numbers. It's a range, so we need to test on both sides of the range and inside the range. If you considered only one partition, you'd want a number smaller than zero, one larger than `16`, and one somewhere in-between as a theoretical minimum. However, there aren't any int's bigger than `16 because it will produce an answer which exceeds the MAX_INT`.

Test should run on the boundary and one past the boundary (or two or three or…). So, the test suite needs to include inputs of `0` and `-1`. It's good practice to sample around the boundary, especially on the positive case side. So the test suite would include `1`, and likely a few more, like `2`, `3`, and `4`. You cannot test for anything other than whole numbers, because the input only accepts ints.

So the minimum total number of tests is six. You can test for all 16 numbers if you really wanted, but the answers will be within the MAX_INT.

There are some test cases that can't be run without causing a stack overflow. Perhaps, the method should be rewritten to expect bigger numbers.