|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| LEARNING PROFILE FOR Chapter04Exercise03 | | | | | |
| *Name* | *:* | *Tyler Lucas* | *Submission Date* | *:* | *N/A* |
| *Student ID* | *:* | *3305203* | *Date Created* | *:* | *2017-05-23* |

# Problem Statement

Chapter 4, Exercise 3

Write a function that simulates rolling a pair of dice until the total on the dice comes up to be a given number. The number that you are rolling for is a parameter to the function. The number of times you have to roll the dice is the return value of the function. The parameter should be one of the possible totals: 2, 3, … 12. The function should throw an IllegalArgumentException if this is not the case. Use your function in a program that computes and prints the number of rolls it takes to get snake eyes. (Snake eyes means that total showing on the dice is 2.)

# Description of the Code

Main method is mostly text, communicating with the user over standard input/output. Uses a helper method getIntInRange(int,int) to repeat asking the user for correct input until it actually gets it, making the code more legible. Uses a chain of methods to get the number of rolls required to achieve a certain dice total, as follows: getDiceRoll() -> getDiceRollSum(int) -> countDiceRollsUntil(int,int) -> main(). Each was designed to be used independently, throwing IllegalArgumentException if appropriate (and as required by the problem statement).

# Errors and Warnings

No issues with version 1.0, but there were some problems encountered when designing method testing and validation scripts (version 1.1+).

# Sample Input and Output

## Exercise Solution Version (Version 1.0)

### Proper Input (2)

Welcome to the magical dice rolling game!

Let's roll a pair until the total we're looking for comes up.

What total are you looking for? Enter 2-12: 2

Rolling...

It took 8 rolls to come up with a sum total value of 2.

### Improper Input 1

Welcome to the magical dice rolling game!

Let's roll a pair until the total we're looking for comes up.

What total are you looking for? Enter 2-12: 1

Please enter an integer between 2 and 12: 0

Please enter an integer between 2 and 12: -1

Please enter an integer between 2 and 12: 121

Please enter an integer between 2 and 12: ten

\*\*\* Error in input: Integer value not found in input.

\*\*\* Expecting: Integer in the range -2147483648 to 2147483647

\*\*\* Discarding Input: ten

Please re-enter: 2147483648

\*\*\* Error in input: Integer input outside of legal range, 2147483648.

\*\*\* Expecting: Integer in the range -2147483648 to 2147483647

\*\*\* Discarding Input: (end-of-line)

Please re-enter: 3

Rolling...

It took 7 rolls to come up with a sum total value of 3.

### Improper Input 2

Welcome to the magical dice rolling game!

Let's roll a pair until the total we're looking for comes up.

What total are you looking for? Enter 2-12: -2147483648

Please enter an integer between 2 and 12: -12

Please enter an integer between 2 and 12: 1

Please enter an integer between 2 and 12: 7

Rolling...

It took 5 rolls to come up with a sum total value of 7.

## Method Testing and Verification Version (Version 1.1)

See Discussion.

# Discussion

Verifying that the methods worked as advertised was more difficult than programming them in the first place. I’m taking another entire course on the statistics required to do so (as part of my math degree). After a dozen hours of work in Excel pumping the logged data for statistics, suffice to say that the program works fine, and the analysis of comparing theoretical dice probabilities versus my program’s measured dice statistics is too complex for this course. Some details can be found in “*analysis.xlsx*”, where I review the statistics of around 100,000 data points generated by the methods.

It works.