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Project 2

CSCI 301

Design Document- Part 2

Introduction:

Recursion is the process of a function calling itself to solve a problem. This programming method is utilized as an alternative way to perform iterative functions and repetitive computations. In the second portion of this program, the user inputs two integers values in the main program that act as the range of values for the program. One of the values acts as the low-end range and the other acts as the high end of the range. All of the values in this range are summed up inclusively.

Data Structures:

In this part of the program, the only data structure that is utilized is integers. The recursive function for this part of the program is passed an integer and that integer is used to calculate the sum of the user’s input. The sum is then returned to the main program, where it is outputted to the user.

Functions:

In this part of the program, the recursive function for this problem is rangeSum(). This function takes in two integer values as parameters and utilized these as the range for the sum. If these two values are equal to one another, then one of the values is returned because the range is a single number. This acts as the base case for the function. If this case is not true, the function calls itself and passing in the low value and the high value minus 1. The high value is also added to the call to ensure that the sum of the digits is obtained at the end. The recursive function call passes in the high value minus 1 so that after each call, the range gets smaller until the low value and high value are equal to one another. This acts as the exit term for the function and terminates the recursive sequence.

The Main Program:

The main program for this portion of the project is fairly simple. It prompts the user to enter two integer values with the first one being smaller than the second one. This allows the user to find the sum of the range of digits between these two values. The main program reads in these two values and the calls the recursive function rangeSum(). The main program uses this function call to output the sum of the digits in this range of values.