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Project 2

CSCI 301

Design Document – Part 1

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 first portion of this program, the function reads in an integer from the user and sums of the values of that integer. The portion of the function that sums up the integers when the number entered is greater than 10, is the recursive call of the function. The sum is then outputted in the main program to the user.

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:

The function for this portion of the project is called sumprint(). This function takes in an integer as a parameter and then returns a sum of the digits of that integer. If the value of the integer is less than 10, i.e. a single digit, then the digit entered by the user is returned as the sum of the digits. This instance acts as the base case of the recursive problem. If this case is not met, then the function calls itself and passes in n/10 as the parameter, where n is the integer entered by the user. The return statement also adds n%10, so that the remainder is added to the sum after each call. This return statement allows for the function to sum up the digits recursively and return them to the main program.

The Main Program:

The main program is relatively simple. It prompts the user to enter an integer value. After this, a function call for sumprint() is made and the main program then outputs the returned value from the recursive function sumprint().