SIT111 Computer Systems

Mult.asm is a program written in Hack assembly language. The program's primary goal is to multiply two non-negative integer values stored in specific memory locations, namely R0 and R1. The result of this multiplication is then stored in another memory location, R2.

In the architecture of the Hack computer, R0, R1, and R2 serve as memory locations, and the D register is employed for data manipulation.

The program initiates its process by setting the value in R2 to zero. Subsequently, it enters into a loop that iteratively adds the value in R1 to R2 while simultaneously decrementing the value in R0. This loop structure effectively mimics the fundamental process of multiplication, where the value in R1 is accumulated in R2 as many times as specified by the original value in R0.

It's worth noting that the program operates under certain assumptions, specifically that the values in R0 and R1 are non-negative, and the product of R0 and R1 does not exceed 32768. These conditions are assumed to hold true without explicit verification within the program.

To validate the correctness of the multiplication operation, the program undergoes testing using provided scripts, such as Mult.tst and Mult.cmp. These scripts serve to ensure that the program produces accurate results in various scenarios.