CSCI 516 - Fundamental Concepts in Computing and Machine Organization
Programming Assignment 2

Due on: 11:55 PM, 10/04/2022

Requirement

- Compile and simulate the assembly program (.S file) using DS-5 simulator.
- Comment your assembly code.
- Name the source file according to the question number, like: 1.S; 2.S, 3.S, etc...
- Only upload the .S files to D2L, DO NOT upload the entire DS-5 project.

Questions

1. Write an LEGv8 assembly program to compute the sum of the generated Fibonacci series. Do not use recursion. Assume the user input n is a 64-bit non-zero positive integer which is stored in X19 and n is the range of the series. Compute the sum of the generated Fibonacci series and store the sum in X20. For example, a Fibonacci series with range of 5 will have 7 terms (0, 1, 1, 2, 3, 5, 8) and the sum is 20. The first two terms (0 and 1) are considered as default terms and is not included in the range.

2. Write an LEGv8 assembly function to find the range of an unsorted array. The function inputs are the base address of the array (stored in X0) and the length of the array (stored in X1). Store the result (range) in X2. Use temporary and saved registers for computation and storage within the function. All the temporary and saved registers used in the function needs to be saved on to the stack. Test the function by calling the function from main. Create a static array of size defined in register X19 and use the static array for testing the function.

3. Write an LEGv8 assembly program to compute the sum of the first n odd numbers using recursion. Assume the user input n is a 64-bit non-zero positive integer stored in X19 and the sum is stored in X20. For example, the sum of first 3 odd numbers (1, 3, and 5) is 9.