2023Fall_CIS126T6CF: Computer Architecture & Organization

Final Project Description Instructor: Dr. Kirk Mousley

Each individual student will select one MIPS programming option from the two options available and detailed below. The student will then program the option within MIPS and the MARS MIPS assembly IDE. Finally, the student will submit the .asm code file to the proper assignment found in the Week 15 course module by the due date and time specified within Canvas. The final project will be worth 200 total points.

OPTION 1: Create and code a MIPS application that calculates, stores (in an array), and prints numbers to the console determined by using the same approach as the Fibonacci sequence. The Fibonacci Sequence is the series of numbers where each number is found by adding together the 2 numbers that came before the relevant value. Your code will ask the user to input the first 2 integer values that will be the start of the sequence. In addition, your code must ask the user to input the number of values (iterations) to be calculated, stored, and shown (valid input should be between 3 and 20 values/iterations inclusively). As an example of how this sequence works here is the start of the Fibonacci sequence with relevant description:

You will notice that the number 2 is calculated by adding the two numbers before it a 1 and a 1...3 is then calculated by adding 2 + 1...5 is calculated by adding 2 + 3...etc. The output should be neat, provide output text to the user, and display the number of iterations specified by the user (neat with appropriate spacing). The code should be easy to read, well documented with comments, and follow all MIPS format and naming conventions. The code must primarily execute properly with the expected result(s). However, the code will be scrutinized and evaluated for a sense of elegance and logic. Please see the attached MIPS Application Development Rubric for specific grading criteria.

OPTION 2: Create and code a MIPS application that asks the user for 2 integers, determines the greatest common divisor (GDC), and then prints the result to the console. The GDC can be easily calculated utilizing the Euclidean Algorithm (video on how it works here: https://www.youtube.com/watch?v=bUz2Fe9L4Xs) The output should be neat and provide a meaningful output text to the user including the result of the GDC value for the user inputted integers. The code should be easy to read, well documented with comments, and follow all MIPS format and naming conventions. The code must primarily execute properly with the expected result(s). However, the code will be scrutinized and evaluated for a sense of elegance and logic. Please see the attached MIPS Application Development Rubric for specific grading criteria.

MIPS Application Development

	Superior	Proficient	Needs improvement	Unsatisfactory	Pts.	Student Score
MIPS Application	MIPS code executes without	MIPS code executes without	MIPS code executes without	MIPS code does not execute	120	
	any compiler errors and	any compiler errors and	any compiler errors and	without any compiler errors or		
	delivers expected results	delivers expected results	delivers expected results	does not deliver expected		
	relevant to inputs. All user	relevant to inputs. All user	relevant to inputs. All user	results relevant to inputs. User		
	interfaces are clear and very	interfaces are clear and	interfaces are somewhat	interfaces are confusing and		
	well designed.	adequately designed.	confusing and unclear.	unclear.		
Algorithms and	Code utilizes and displays	Code mostly utilizes and	Code somewhat utilizes and	Code does not utilize and	40	
Decision Logic	sound utilization and	displays sound utilization and	displays sound utilization and	display sound utilization and		
	implementation of algorithms,	implementation of algorithms,	implementation of algorithms,	implementation of algorithms,		
	decision logic, and arithmetic					
	functions	functions	functions	functions		
MIPS Conventions	All MIPS naming conventions,	20				
	formatting conventions, and	formatting conventions, and	formatting conventions, and	formatting conventions, and		
	coding best practices are	coding best practices are most	coding best practices are	coding best practices are not		
	always used throughout the	of the time used throughout	somewhat used throughout	used throughout the code		
	code	the code	the code			
Code Comments	Thorough and comprehensive	Adequate code commenting is	Code commenting is	Code commenting is not used	20	
	code commenting is always	always used throughout the	somewhat confusing or not	throughout the code		
	used throughout the code	code	thorough enough			
					200	
TOTAL POSSIBLE	MIPS APPLICATION DEVELO	OPMENT POINTS				

Overriding criterion: Originality and authenticity. If the deliverable is identified as not being original, and/or not done by the students, the instructor has the right to grade the project as an automatic F (Zero (0) points total for the project).