EEE4084F Quiz 1: Lectures 1-3

24-Feb-11

This quiz is for marks!

PLEASE ANSWER ON A SEPARATE PAGE

MAKE SURE YOUR STUDENT NUMBER IS ON YOUR ANSWER PAGE(s)

TOTAL NUMBER OF QUESTIONS : FIVE

time(min): **40**

#	Question	Marks		Min
Q1	(a) Give two examples of mainstream applications that are meaningful to implement using a parallel compuing architecture. [2 marks] (b) For each application mentioned for part (a) motivte why this would be suited to a parallel architecture. [2 x 2 = 4 marks]	6		4
Q2	Discuss benefits and drawbacks of the different types of computing approaches, i.e. contrasting between 1) a purely hardware implementation, 2) a solution that involves software on a fixed architecture, and 3) a reconfigurable computing platform. (for this question you do not have to list a total of 6 points, some of the marks are allocated to structuring meanigful and logical sentences). [6 marks]	6		4
Q3	(a) What is meant by the term 'automatic parallelism'? [2 marks] (b) Discuss how such a process might be achieved. [4 marks] (c) Mention three drawbacks or challenges that would need to be overcome in order to make automatic parallelism effective. [3 marks]	9		6
Q4	(a) Briefly explain the difference between the spatial and the temporal computing paradigms. (Optional rough sketch to aid your explanation.) [4 marks] (b) Briefly discuss why you think it may would be nice if parallel programs could be effecitvely coded using the temporal paradigm. [3 marks]	7		6
Q5	Consider the following application requirements. Note that these requirements are not in a sequential order, you need to consider the dependencies and relations between them. - Create an internal integer variable C that is initially set to 0 - The program must input two integer values, A, B - The program must output a value Z that is either 0 or 1 - Input a value for B at the start of the program - While A is less than B, input a new A - When a new A has been input and A is an odd number, set variable C to C + A + B - Whenever C changes, and C is zero, set output Z to 1; set output Z to 0 otherwise.	17		
	Complete the following for Q5:			
	(a) Provide a spatial representation of the program described above. Attempt to describe your solution as structurally clearly as you can. [10 marks]			8
	(b) Discuss potential drawbacks, and possible improvements, to the way the requirements for this program are documented. Consider the scalability of this approach, as it how it would influence a larger and more complex application. [4 marks]			6
	(c) Consider the following scenario and decide if the program terminates. If the program terminates, what will the final value of Z be (i.e. 1 or 0)? Assume 32bit integers are used. [3 marks]			6
	input B is set to 5			
	input A is set to 3			
	input A is set to 1			
	input A is set to 2			
	input A is set to 2			
	input A is set to 8			
	TOTAL :	45		**40**