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6.189 Multicore Programming Primer, January (IAP) 2007

Please use the following citation format:

Name: _____

Instructions: Write out your answers clearly in the space provided. You may use both sides of the page if necessary. Please write legibly.

Question 1: You've been hired by a new startup company to custom build them a new multicore processor for their killer application. You have a team of architects and engineers at your disposal who can design the processor if they only knew how many cores are needed. There's a limited budget and you need to keep costs down.

You determine that 60% of the tasks in the application can run in parallel, and that the work can be uniformly divided among them. If your design team can put a maximum of 1000 cores on a chip, how much of a speedup can you expect? What other factors might you consider in determining how to build your processor?