CS 429 Homework 13

Name: __________________ Section #: __________________

Instructions: As usual, you may collaborate with your classmates and ask for assistance from the TA. But don’t copy anyone else’s answer.

1. Protein string matching code currently takes around 4 days of execution time on the current machine. 20% of time is spent doing integer instructions and 35% doing i/o. Which is the better optimization?

   (a) Compiler optimization that reduces the number of integer instructions by 25%, assuming each integer instruction takes the same amount of time.

   (b) Hardware optimization that reduces the latency of each i/o operation from 6ms to 5ms.

2. Recent advances in process technology quadrupled the number of transistors you can fit on a die. Currently your customer uses up to 4 processors for 40% of their application. Which of the following optimizations gives the most improvement?

   (a) Increase the number of processors from 1 to 4.

   (b) Use 2 processors but add features that will allow applications to use them for 80% of execution.

3. This question is optional. It won’t be graded. Do problem 7.6 on p. 714 of Bryant and O’Hallaron.