CS2710 Homework Assignment 3

Due: Monday, December 10, 2012.

Problem 1: Complete problems 1.15 parts 1, 2, and 3.

Problem 2: A program takes 15 seconds to execute a given computer. A new compiler is released with only requires .5 times as many instructions, but it increased the CPI by 1.2 due to a different instruction profile. What will be the execution time of the new program?

Problem 3: A developer is using the AMD Opteron X4 Barcelona processor, and it is operating at a 50% load using a power supply of 1.2 volts. A designer would like to get better performance out of the system by increasing the clock frequency by 50%. Assuming the capacitive load does not change, what would the voltage need to be for the core if the net power was to remain the same?

Problem 4: A new performance metric has been created for SPEC, dealing with the number of bytes transferred over a network per unit time. Four different tests are involved in calculating the performance, and the scores are 100, 1000, 2200, and 4400. What would be the spec benchmark score for this system? (Hint: SPEC benchmarks are calculated as the Geometric mean of the values. See http://en.wikipedia.org/wiki/Geometric_mean for an explanation of Geometric mean.)