Lab 1: Performance

CS 350: Computer Organization & Assembler Language Programming
Due Sat Feb 2*, 11:59 pm (all labs will be due just before midnight)
* changed 2019-01-30

How to submit
See See http://cs.iit.edu/~cs350 → Lab Policies for information on working with others, how to submit, etc. If you want to submit multiple files, zip them together and submit the zipped file.

Problems [50 points total]
For all the problems (except #1), show your calculations. Labeling is good too. E.g., "If a woodchuck can chuck wood at the rate of 2 pounds a minute, how much wood will the woodchuck chuck in an hour?"

Wood chucked = Woodchuck rate * Chuck time = (2 lb / min) * 1 hr = 120 lb

1. [6 points] Exercise 1.2 a-c. (Eight great ideas.)
   For (b), assume breaking only one cable won't cause the bridge to collapse.
   \[\text{For (c), the wind information comes from a weather forecast.} \text{changed 2019-01-24}\]

2. [4 points] Exercise 1.4. (Frame buffer)

3. [10 = 2 * 5 points] Exercise 1.6. (Class and Global CPI)

4. [9 = 3 * 3 points] Exercise 1.7. (Compiler affects CPI)
   For (c), give the speedup as a ratio.

5. [4 points] Exercise 1.9.1. (# Processors affects Execution Time)

6. [5 points] Exercise 1.9.2. (CPI affects Execution Time)\(^1\)

7. [6 points] Exercise 1.9.3. (Change # Processors to effect CPI)

8. [6 points] Exercise 1.14.2. (Change CPI to effect Execution Time)
   Read this problem as "To what must we set the L/S CPI if we want ...?"
   The book has a typo throughout the description in 1.14: "106" should be "10^6" or "10^6".
   So, \(50 \times 10^6\) FP instructions (not \(50 \times 106\), etc.

\(^1\) If necessary, consult a dictionary for the difference between verbs "affect" and "effect". : -)

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