Name : _____ Student ID: _____

COMP41106, Fall 2018
Quiz 1
10/01/18

| Ques | Points | Score |
|---|---|---|
| 1 | 5 | |
| 2 | 10 | |
| 3 | 10 | |
| 4 | 10 | |
| 5 | 15 | |
| Total | 50 | |

Notes
1. This exam contains 2 pages and 5 questions. Check to see if any pages are missing.
2. Put your name and student ID on the top of each page.
3. Write clearly.
4. Mysterious or unsupported answer will not receive full points. A correct answer, unsupported by calculations, explanation will receive no point; an incorrect answer supported by substantially correct calculations and explanation will receive partial points

1. What is the Moore's Law? (5 points)

2. What is the overall speedup if you make 10% of a program 90 times faster? [hint: Amdahl's law] (10 points)

3. Consider two different processor P1 and P2 executing the same program.
   - Each processor executes the same number of instructions for the program.
   - P1 has a 4.0 GHz clock rate and a CPI of 3.0 for the program.
   - P2 has a 2.0 GHz clock rate and a CPI of 1.0 for the program.

   **Which processor is faster, and by how much?** (10 points)

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4. For the following C statement, what is the corresponding MIPS assembly code? Assume that the variables **f**, **g**, and **h** are assigned to registers **$s0, $s1**, and **$s2**, respectively. You can use **$t0** to store temporary values. (10 points)

f = g + ( h + 5 );

5. For the following C statement, what is the corresponding MIPS assembly code? Assume that the variable **g** and **h** are assigned to **$s1** and **$s2**, respectively. A is an array of 4-byte words. Base address of array A is in register **$s3**. You can use **$t0** to store temporary values. (15 points)

g = h + A [10];