1 Administrivia

Announcements

Assignment

Read 3.1–4.

Homework due Feb. 9: 2.13, 2.29–2.32.

From Last Time

Measuring performance.

Outline

1. More definitions and terms.

2. Practice.

Coming Up

Instructions and operands.
2 More Definitions and Terms

1. How should we summarize several benchmarks?

   (a) Should we summarize?

   (b) Use sum of execution times.

   (c) Arithmetic mean is proportional.

   (d) See text for interesting discussion of use of geometric means.

   Example:

<table>
<thead>
<tr>
<th>Program 1 (seconds)</th>
<th>Machine A</th>
<th>Machine B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program 2</td>
<td>1000</td>
<td>100</td>
</tr>
<tr>
<td>Total time</td>
<td>1001</td>
<td>110</td>
</tr>
</tbody>
</table>

   (a) Which machine is faster on Program 1? Program 2? Combined?

   (b) Would your answer vary depending on execution frequency? How could we account for this? (Weighted average.)

2. Native MIPS:

   \[
   \text{MIPS} = \frac{\text{Instruction Count}}{\text{Execution time} \times 10^6}
   \]

   As opposed to peak MIPS or relative MIPS.

   Native MIPS can vary inversely with CPU time!

3. Useful design principle: Make the common case fast.

3 Practice

Problems 2.18–2.24.