CS286: Lecture Note (Lecture #11, September 26, 2022)

The agenda for CS286 lecture #11 (September 26, 2022):

1. **Pick up:**
   - Attendance card

2. **Quiz #5 is scheduled on next Wednesday (9/28):**
   - Quiz #5 question list has been posted to the course home
   - We will discuss Quiz #5 questions at the end of this lecture

3. **Project #2 will be introduced on Wednesday (9/28)**

4. **Introduction to “processor datapath”**
   - Datapath_Architecture.ppt

   The Quiz #5 questions this talk will cover:

   - **#8:** What does “CPI” stand for? What does it mean?
   - **#9:** What is “processor clock cycle”?
   - **#10:** What is “processor clock cycle time”?
   - **#11:** Show the formula to calculate the execution time (for scalar processors) using, IC (instruction count), R (clock cycle rate), and one more parameter.
   - **#12:** Processors with a lower clock rate execute the same binary programs faster than the processors with a higher clock rate. How is this possible?
   - **#13:** For the following performance metrics for processors, show which way each metric is better:
     - **Execution time:** short long
     - **CPU Clock rate:** low high
     - **Clock cycle time:** short long
     - **CPI:** small large
<table>
<thead>
<tr>
<th>MIPS rate</th>
<th>small</th>
<th>large</th>
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#14: What are “scalar datapath processors”?

#15: What are “pipeline datapath processors”?

#16: What are “super-scalar datapath processors”?

#17: What are “super-pipeline datapath processors”?

#18: What are “VLIW datapath processors”?

#19: What are “vector datapath processors”?

5. Exercises (those posted on September 1st)