Quiz/PS 3 Review

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Section 9
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Agenda

• Quiz Review
  – Register Renaming
  – ROB
  – Branch Prediction
  – Memory in OoO

• Problem Set Questions/Review
Register Renaming

• What are we doing?
  – Mapping Architectural Register to Physical Registers to eliminate WAW and WAR hazards

• Example on board
ROB

• What are we doing?
  – Tracking instructions that have been decoded but not committed
  – Program order is maintained from in-order decode and in-order commit

• Example on board
Branch Prediction

• What are we trying to do?
  – Predict the control flow direction
  – Superscalar concerns?
    • how do we handle multiple branches per fetch packet
  – Out of order concerns
    • Machine will be bottlenecked by fetch if we don’t do a good job

• Example with on board
OoO Memory operations

• What are we trying to do?
  – Allow memory operations to execute out of order
  – What are our constraints?
    • Cannot make store data visible to memory before instruction commits
    • Loads must get the right value

• Example on board
Problem Set Review
Questions