CS311 - Computer Architecture - Spring 2017
Final (Wednesday, May 6, 8:00 AM) – Review

1. Chapter 4: Pipelining

   (a) Overview of Pipelining
   (b) Hazards
       i. types
       ii. solutions
   (c) MIPS Pipelining
       i. datapath
       ii. new registers
       iii. hazard detection
       iv. forwarding and stalls
       v. branch hazards
   (d) Branch Prediction
       i. static vs. dynamic schemes
       ii. saturation counters, BHT, PHT
       iii. local vs. correlated prediction schemes
   (e) Pipeline Enhancements
       i. increase depth of the pipline
       ii. static multiple issue
           A. issue packets
           B. loop unrolling
       iii. dynamic multiple issue
           A. in-order vs. out-of-order
           B. register renaming

2. Chapter 5: Memory

   (a) Overview
   (b) Caches
       i. 1 block and multiblock
       ii. reads and writes
   (c) Performance
       i. cache
       ii. overall system
   (d) Reducing cache misses
       i. associative mapping strategies
       ii. multi-level caches
   (e) Virtual Memory
       i. concept and advantages
       ii. page table
       iii. translation-lookaside buffer
   (f) Interaction of TLB, cache and VM
   (g) Page Replacement Algorithms
       i. LRU
       ii. FIFO and Clock
       iii. NFU and Aging
       iv. Tree PLRU