Chapter 04: Instruction Sets and the Processor organizations

Lesson 12:

Instruction Set of a GPRs based processor

Objective

- To understand Instruction set of a GPR based processor

GPRs based Processor Instruction Set

GPR Instruction Set

- LD ra, (rb) ra ← M[rb]
- ST (ra), rb M[ra] ← rb
- MOV ra, rb ra ← rb
- ADD ra, rb, rc ra ← rb + rc Integers
- FADD ra, rb, rc fa ← fb + fc Floating Points
- SUB ra, rb, rc ra ← rb - rc Integers

GPR Instruction Set

- FSUB ra, rb, rc — ra ← rb - rc Floating Points
- MUL ra, rb, rc — ra ← rb × rc Integers
- FMUL ra, rb, rc — ra ← rb × rc Floating Points
- DIV ra, rb, rc — ra ← rb ÷ rb Integers
- FDIV ra, rb, rc — ra ← rb ÷ rb Floating Points

GPR Instruction Set

- AND ra, rb, rc — ra ← rb .AND. rc Binary Numbers
- OR ra, rb, rc — ra ← rb .OR. rc Binary Numbers
- NOT ra, rb, rc — fa ← NOT rb, Binary Numbers

GPR Instruction Set

- ASR ra, rb, rc ra ← rb arithmetic left or right (+ or –) shift by rc specified bits
- LSH ra, rb, rc ra ← rb logical left or right (+ or –) shift by rc specified bits

GPR Instruction Set

- BR ra PC ← ra as Label bits in ra
- BR Label PC ← label assigned bits by program text/assembler

GPR Instruction Set

- BEQ ra, rb, rc PC ← ra if rb is equal to rc
- BEQ Label rb, rc PC ← label assigned bits by program text/assembler if rb = rc
- BNE ra, rb, rc PC ← ra if rb ≠ rc

GPR Instruction Set

- BNE Label rb, rc PC ← label assigned bits by program text/assembler if rb ≠ rc
- BLT ra, rb, rc PC ← ra if rb < rc
- BLT Label rb, rc PC ← label assigned bits by program text/assembler if rb < rc
- BGT ra, rb, rc PC ← ra if rb > rc

GPR Instruction Set

- BGT Label rb, rc PC ← label assigned bits by program text/assembler if rb > rc
- BLE ra, rb, rc PC ← ra if rb is less or equal to rc
- BLE Label rb, rc PC ← label assigned bits by program text/assembler if rb < or = rc

GPR Instruction Set

- BGE ra, rb, rc PC ← ra if rb is greater or equal to rc
- BGE Label rb, rc PC ← label assigned bits by program text/assembler if rb > or = rc

Summary

We learnt

- Instruction set of a GPR based Processor

End of Lesson 12on

Instruction Set of a GPRs based processor