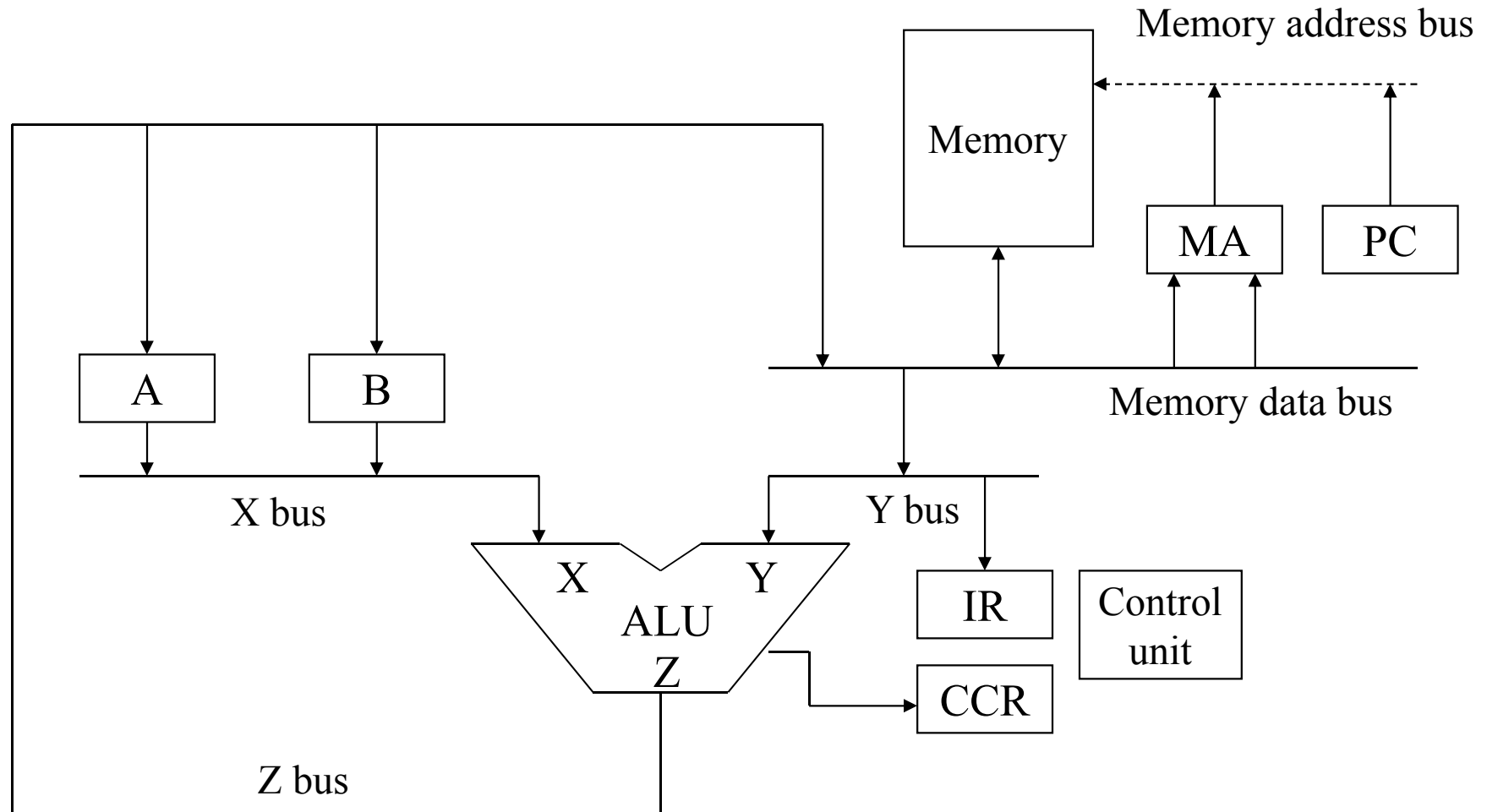


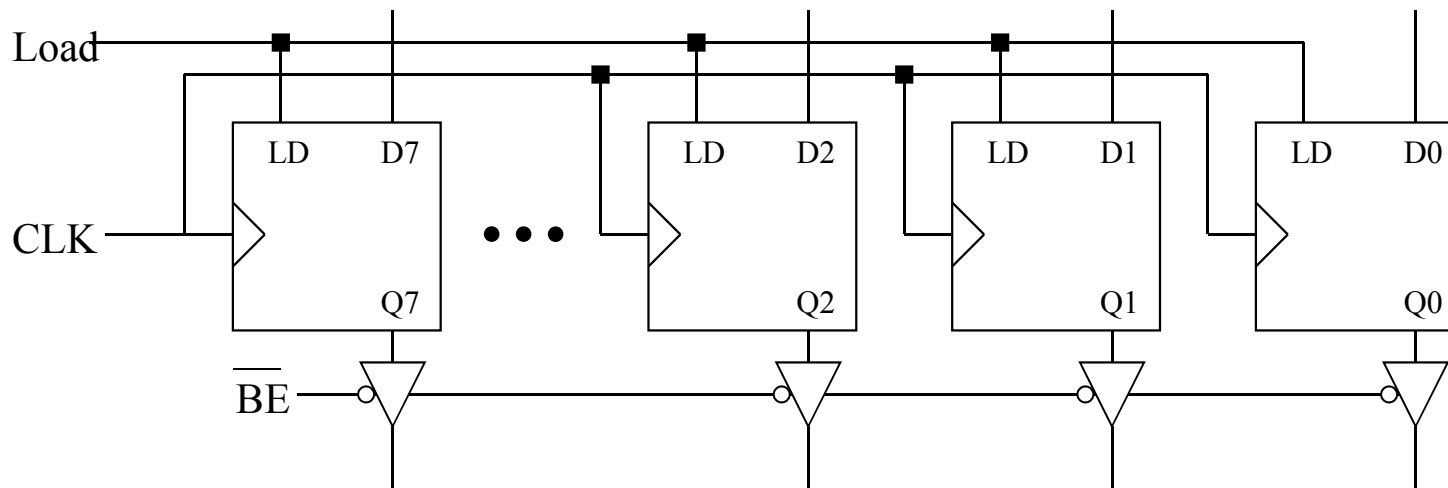
Microprocessor Overview

Microprocessor Design



Structure of a register

- Load data in off a bus
- Connect register output to a bus
- Consider a 8-bit register



- How to load or hold?
- How to connect to bus (need a way to connect/disconnect)
→ Tri-state buffer

Steps for executing instruction(s)

- Instruction Interpretation – 2 steps
 - Fetch – instruction & address, etc bytes from memory
 - Execute – perform instruction
- Fetch:
 - 1st clock: $\text{Mem(PC)} \rightarrow \text{IR}, \text{PC}+1 \rightarrow \text{PC}$
 - 2nd clock: $\text{Mem(PC)} \rightarrow \text{MA}<15:8>, \text{PC}+1 \rightarrow \text{PC}$
 - 3rd clock: $\text{Mem(PC)} \rightarrow \text{MA}<7:0>, \text{PC}+1 \rightarrow \text{PC}$
- Execute:
 - 4th clock: $A + \text{Mem(MA)} \rightarrow A$
- 4 clock cycles to execute
 - 2 Mhz clock $\rightarrow T=0.5 \text{ us}$
 - 4 cycles = 2 us