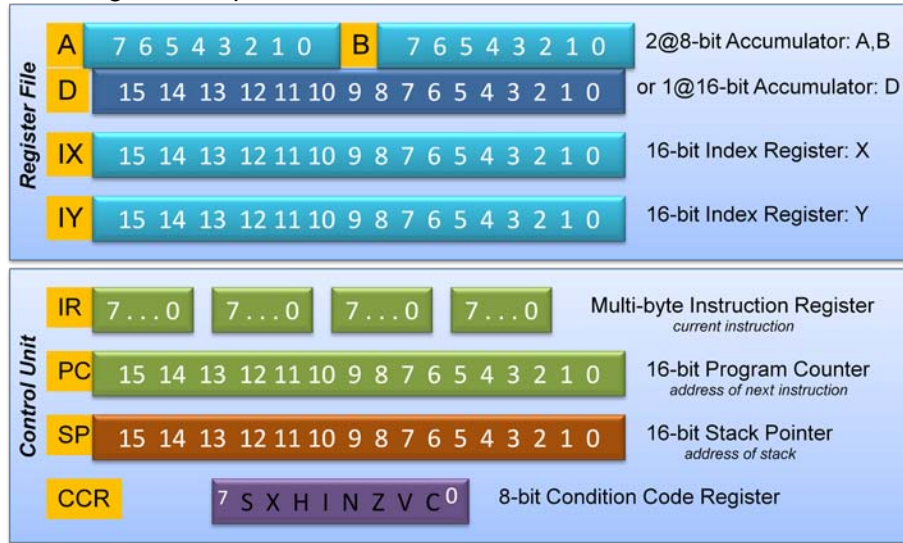


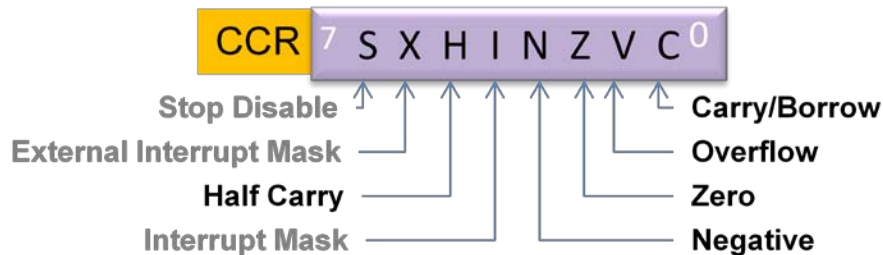
ECE 331 Handout 2: ASM Instruction Execution

68HC12 Programmer's Model

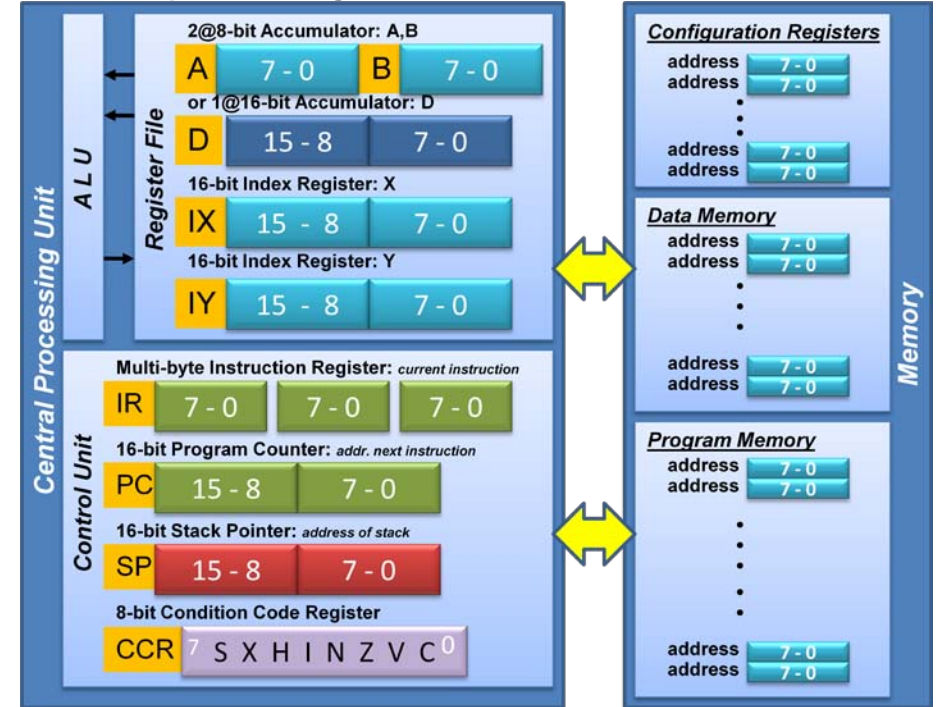
CPU Registers important to instruction execution



68HC12 Condition Code Register



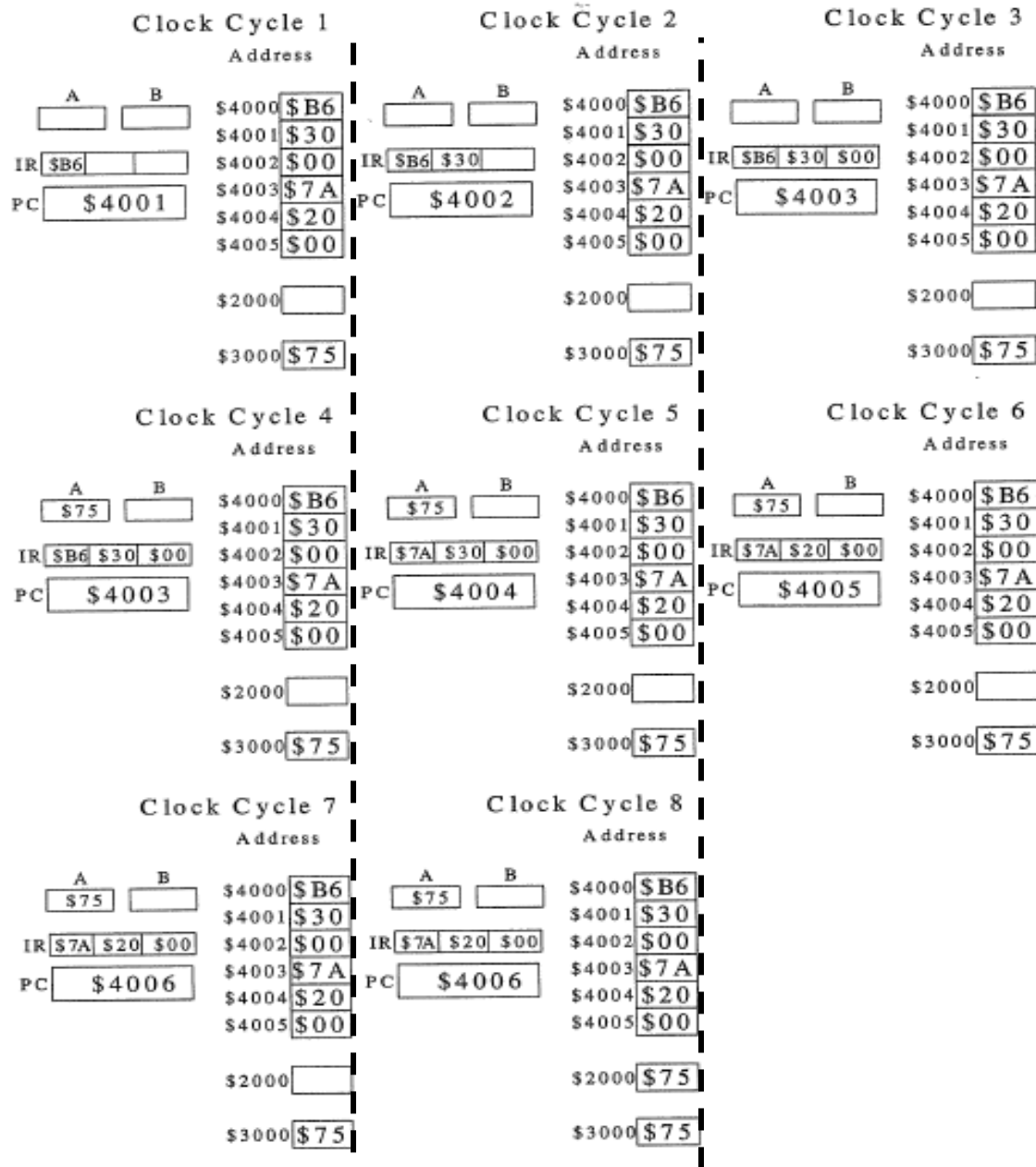
68HC12 Expanded Programmer's Model



Microcontroller Program Execution: from concept to action

- A. Write program to complete task
 - check syntax; test functionality (*Simulator*)
- B. Assemble program (*Assembler*)
 - ASM code → Machine code (op-codes and operands)
- C. Upload program to **program memory**
- D. Run program on **Microcontroller**
 - set PC to start of **program memory**
 1. **fetch** instruction to IR from **program memory**
 2. **decode** instruction: set ALU to perform instruction
 3. **execute** instruction: load/store to **data memory**
 - advance PC to next instruction in **program memory**
 - repeat step 1 until commanded to stop

Cycle-by-cycle Instruction Execution Example



Code Executed:
 LDAA \$3000 (load from \$3000)
 STAA \$2000 (store to \$2000)

Legend:
 IR = Instruction Register
 PC = Program Counter
 Data Memory: \$2000, \$3000
 Program Memory: \$4000-4005