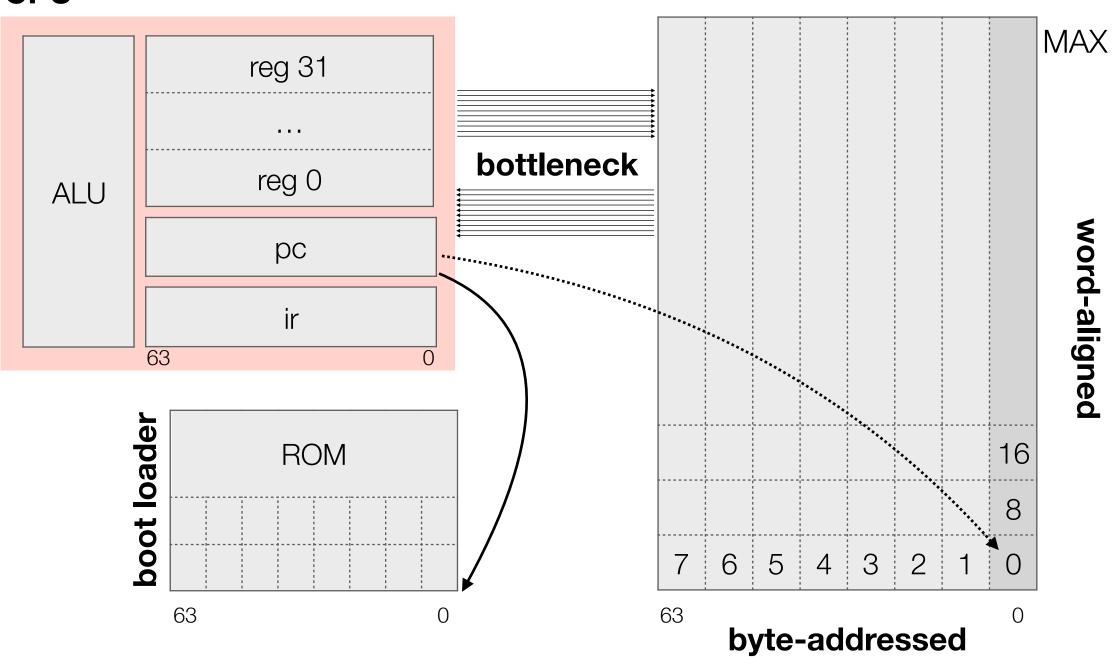
# Von Neumann Machine

#### **CPU**



### More about the Von Neumann architecture

# Von Neumann Machine

- Key idea code and data in same memory
- How do we know what code is and what data is?
  - The **program counter** points to an instruction in memory making it code. This instruction may instruct the processor to load bits from memory and modify them making these bits data.
- Bootstrapping Loading the first program
  - At the very beginning hardware support is needed to set the PC to address 0 of the memory where the boot-loader code is stored.
  - The boot-loader is code stored in non-volatile memory (ROM) that instructs the processor to load code.
  - Last instruction sets the PC to address 0 of main memory.

### Von Neumann Machine

