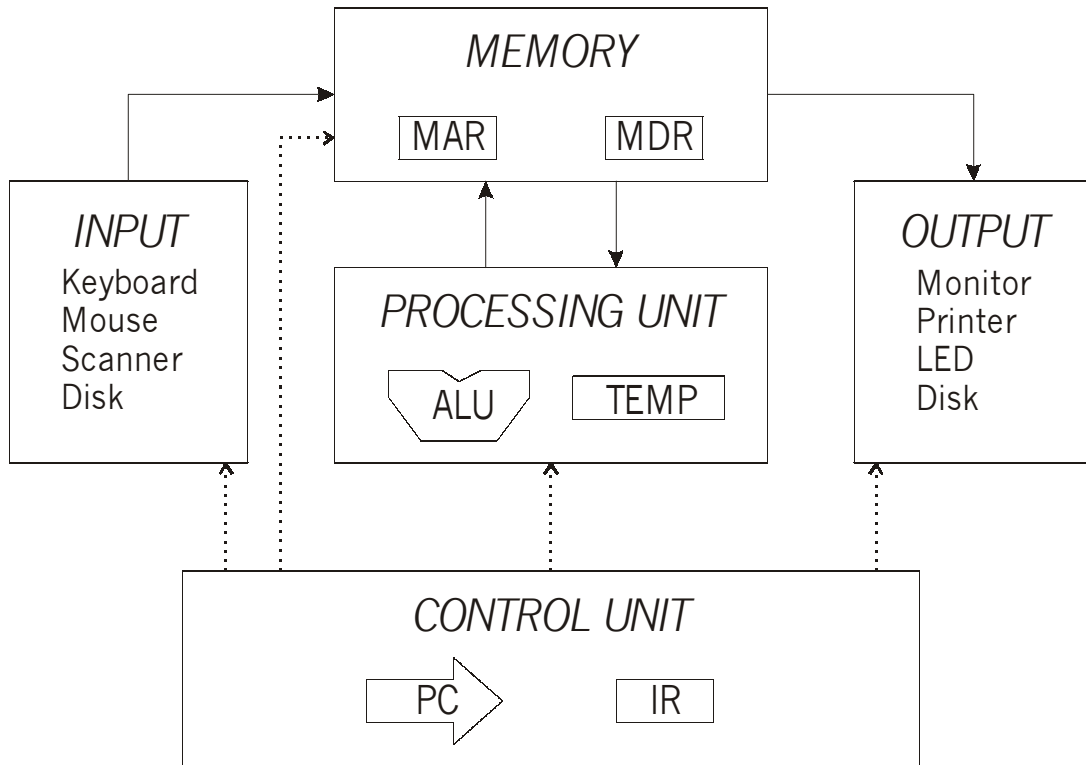
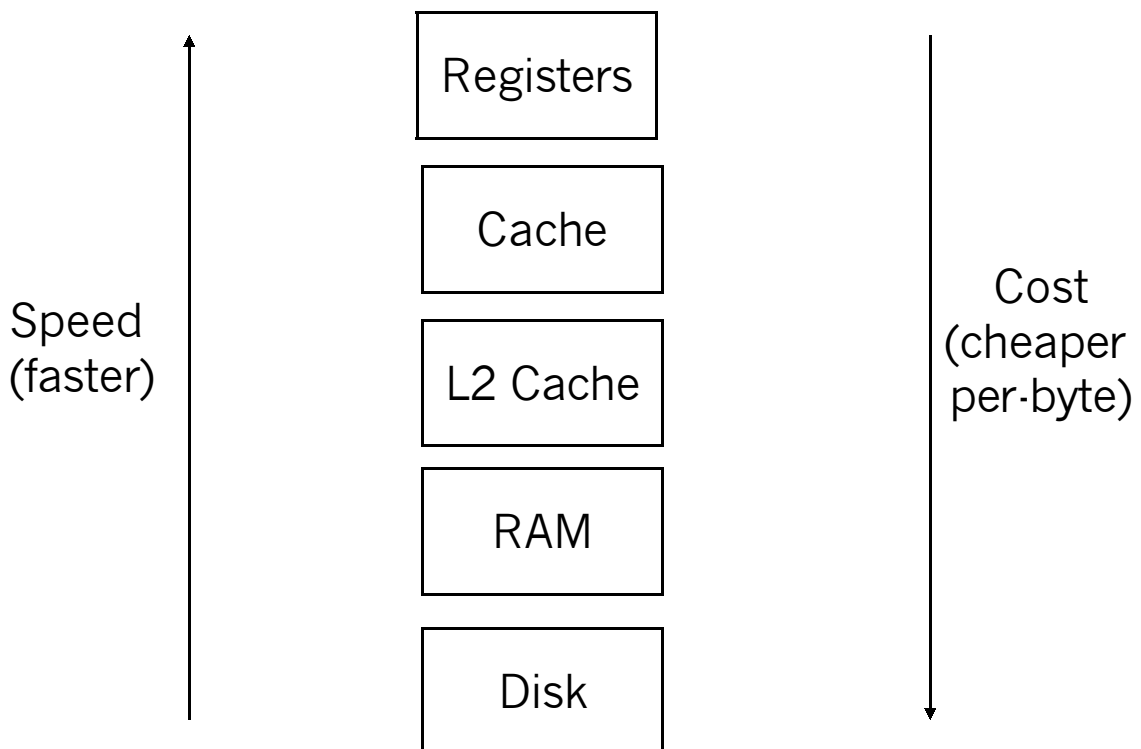


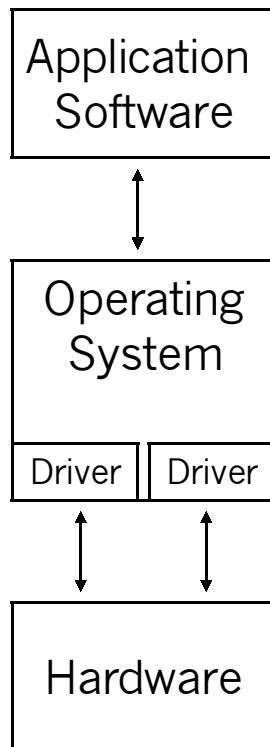
# Von Neumann Model



# Memory Hierarchy



# View of Computer System

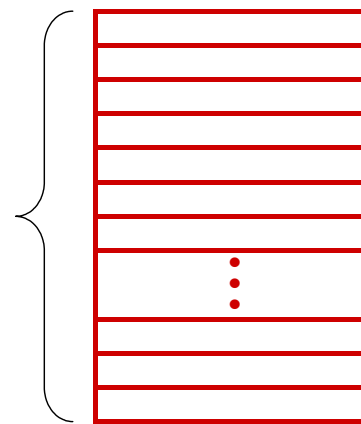


## Memory

Now that we know how to store bits, we can build a memory -- a logical  $k \times m$  array of stored bits.

**Address Space:**  
number of locations  
(usually a power of 2)

$k = 2^n$   
locations



**Addressability:**  
number of bits per location  
(e.g., byte-addressable)

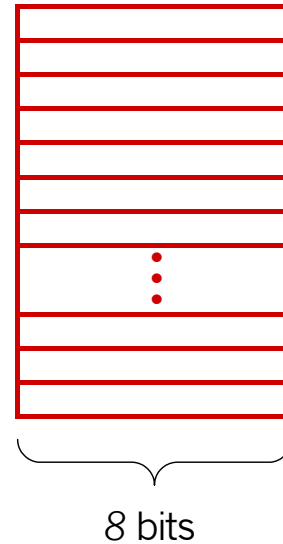
$m$  bits

## Memory

Example: Memory addresses if  $m=8$

$2^{16}$  locations = 65536 (64k)

Addresses are 0x0000 to 0xFFFF



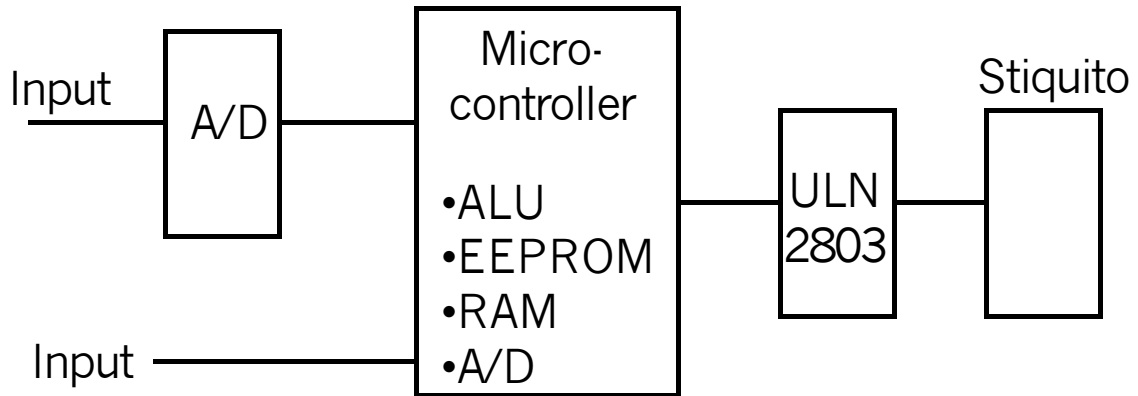
## Even More Memory Details

There are other types of “non-volatile” memory devices:

- ROM
- PROM
- EPROM
- EEPROM
- Flash

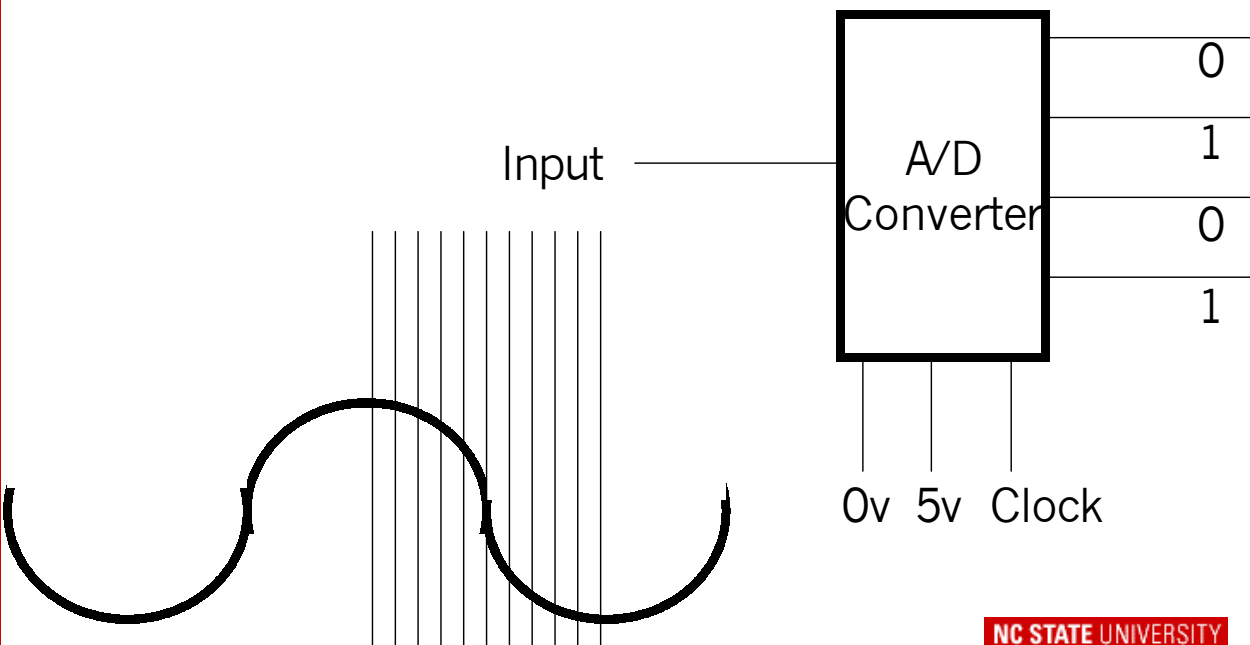
Can you think of other memory devices?

# A Sample Stiquito Microcontroller System



## Analog/Digital Converter

An A/D converter takes an analog signal and represents it as a digital number at a regular time interval.



## Lab 6 . . . . .

- Lab 6 will use the Basic Stamp 2 to make Stiquito walk.
- Use the tethered Stiquito you built for Lab 4.