8/31

* RAM memory aka main memory is used by the cpu to store program code & data associated with it
* every running program & piece of data must be in RAM memory
* CPU has direct access to RAM memory
* **Machine cycl**e - a sequence of steps that CPU takes to execute one single instruction

Step 1: fetch (reading instruction from RAM memory, putting in CPU)

Step 2: decode (CPU gets instruction from RAM, needs time to understand the binary instructions)

Step 3: execute (do what instructions say)

Step 4: write-back (some instructions require the results to be placed wherever necessary)

* 4 bytes per CPU register
* Properties of RAM memory

- RAM memory is volatile (data lost once computer goes off; register is also volatile)

- slow in time it takes to read & write data (compared to CPU; CPU much faster than RAM )

- Random-access (accessing data happens in the same amount of time/at the same speed from any physical location of memory device

* **Memory stall** - when CPU freezes & waits for data from RAM memory
* **Cache memory** - speed up interactions between CPU & RAM, additional memory device used, close to CPU, relatively fast, will check cache memory before going to RAM & if sought after data is in cache memory then no need to check RAM (faster process)
* Register connected to cache , cache connected to RAM

Register -> cache —--------> RAM —------------------------------> HDD & SSD

(top to bottom)

* Harddrives, usb drives, to store data to avoid volatility