23 Memory Access

Wednesday, October 28, 2015 10:01 AM

Time a matrix function, doesn't always take the same amount of time.
Because computer is doing other stuff as wel as executing your program

Time ./matrix
./xtime ./matrix
Nice -20 ./xtime ./matrix (prioritizes the one program)
Doesn't make too much a difference on a small program

Now try switching
matrix[i][j]
matrix[j][i]
Doesn't affect corectness, but the second one takes much longer

CPU was built to run I, j faster than j, I most people run I, j so they built the CPU to run the common things fast

Memory Access is not Constant Time

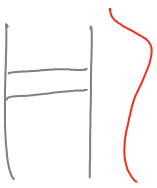
CPU instruction
Asm volatile

Every new digit comes takes a little more time
3d0, 7d0, bd0, fd0, 13d0
Actually w.e. d0 takes longer

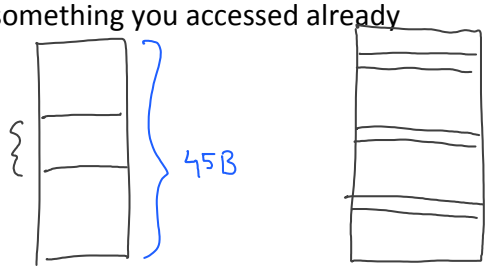
CPU would just be idling sometimes

Data - spatial locality - where you just accessed memory, most likely to access memory around it

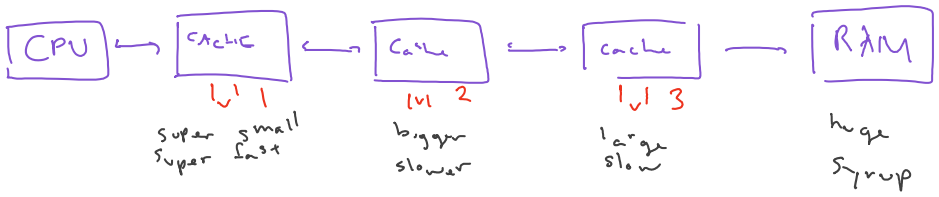
Time - temporal locality - next access will be most likely



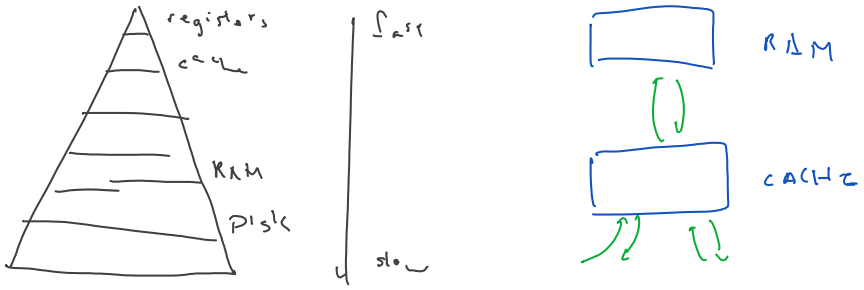
something you accessed already



RAM is expensive
either fast or big



CPU doesn't want to touch RAM, it takes too long



Cache knows what is has and will call if doesn't have