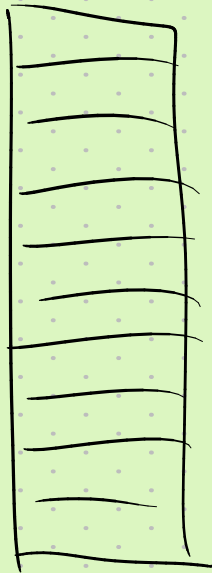


CPU

main memory



main memory:  
giant list of numbers

CPU: fast arithmetic,  
move numbers around  
in main memory

Note: CPU does NOT speak C++. It speaks arithmetic.

Compiling: translate from C++  $\rightarrow$  "arithmetic"

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## Datatypes

int: signed integers  $2^{-31} \leq x < 2^{31}$

unsigned int: integers  $0 \leq x < 2^{32}$

short: integers  $2^{-15} \leq x < 2^{15}$

long: " "  $2^{-63} \leq x < 2^{63}$

float: floating point #s — uses scientific notation.  
uses 32 bits.

double: like float but 64 bits

(more precision in coefficient; larger range of exponents)

char : used for printable characters.

$$\text{range } -2^7 \leq c < 2^7$$